89-1079

No. —

IN THE

Supreme Court of the United States

OCTOBER TERM, 1989

PPG INDUSTRIES, INC.,

Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,

Respondent.

Petition For Writ Of Certiorari
To The United States Court Of Appeals
For The Fifth Circuit

APPENDIX

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INDEX TO APPENDICES

APPENDIX A

United States Court of Appeals,
Fifth Circuit.

No. 87-4849, et al.*

CHEMICAL MANUFACTURERS ASSOCIATION, et al.,

Petitioners,

v.

U.S. ENVIRONMENTAL PROTECTION AGENCY,

Respondent.

March 30, 1989.

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* Sterling Chemicals, Inc. (87-4850); Paul M. Toce (87-4868); Gulf Coast Waste Disposal Authority (87-4920); Union Carbide Corporation (87-4928); Air Products Manufacturing Corporation and Air Products and Chemicals, Inc. (87-4929); E.I. Du Pont de Nemours & Co. (87-4930); Synthetic Organic Chemical Manufacturers Association, Inc. and Dixie Chemical Company, Inc. (87-4934); Monsanto Company (87-4936); Natural Resources Defense Council, Inc. (88-4077); National Paint & Coatings Association (88-4125); Rubicon, Inc. (88-4129); The Dow Chemical Company (88-4135); The Goodyear Tire & Rubber Company (88-4153); Texas Eastman Company, a division of Eastman Kodak Company (88-4154); Laroche Chemicals, Inc. (88-4176); PPG Industries, Inc. (88-4177); FMC Corporation (88-4186); Koppers Company, Inc. (88- 4189); The Lubrizol Corporation (88-4192); Akzo Chemicals, Inc., Et Al. (88-4193); Hoechst Celanese Corporation and Hoechst Celanese Chemical Group, Inc. (88-4194); Ethyl Corporation, Et Al. (88-4195); QO Chemicals, Inc. (88-4196); M & T Chemicals, Inc. (88-4246); Borg-Warner Specialty Chemicals, Inc. (88-4272); Sherex Chemical Company, Inc. (88-4274); Allied-Signal, Inc. (88-4284); W.R. Grace & Company (88-4305); Courtaulds Fibers, Inc. (88-4526).

Petitions for Review of an Order of the Environmental Protection Agency.

Before RUBIN, GARZA and KING, Circuit Judges.

By RUBIN, GARZA and KING, Circuit Judges Jointly.

Acting under the mandate of the Clean Water Act (CWA),[1] the Environmental Protection Agency (EPA) has promulgated final regulations limiting the discharge of pollutants into the nation's navigable waters by manufacturing plants in the organic chemicals, plastics, and synthetic fibers (OCPSF) industries. The regulations, which the statute requires to be implemented beginning March 31, 1989, cover both direct discharge and indirect discharge through publicly-owned treatment works (POTWs). The Chemical Manufacturers Association (CMA) and a number of companies affected by the regulations allege both procedural defects in their promulgation and substantive defects in various provisions, as well as defects in the application of specific provisions to particular plants. Intervening in some of the cases consolidated for review and appearing as amicus curiae in the others, the Natural Resources Defense Council (NRDC) also challenges the regulations, but on the different ground that they fail to require a sufficiently high degree of effluent pollution control. Although it contends that the regulations are invalid, the NRDC urges that they be enforced until more stringent standards can be adopted.

The case is of such complexity that the parties have submitted briefs totalling more than 3,000 pages and a joint appendix 9,000 pages long distilled from a 600,000-page administrative record. To enable us to render a decision as promptly as possible, the members of the panel have divided responsibility for preparing portions of this opinion, as the District of Columbia Circuit did in *Alabama*

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[1] 33 U.S.C. §§ 1251-1376.

Power Co. v. Costle.[2] Judge Garza prepared sections V, VI, and VII of this opinion, as well as all portions discussing issues raised by the NRDC; Judge Rubin prepared sections I and III; and Judge King prepared sections II and IV, except for those portions discussing issues raised by the NRDC.

This is a summary of our rulings on the principal issues:

I. The EPA did not violate the notice-and-comment requirements of the Administrative Procedure Act (APA) by: (1) utilizing an updated Dun & Bradstreet economic-impact study to supplement data it had previously disclosed without making the new data public either during the notice-and-comment period or in the public record except to this court under seal; or (2) by failing to publish its regulations for the control of toxic metals for public comment prior to final promulgation.

II. Best Practicable Technology (BPT) Issues:

A. The EPA's Consideration of the Costs of Complying with the BPT Limitations:

1. The Act does not require the EPA to apply a 'knee-of-the-curve' cost-effectiveness test in establishing BPT limitations; the EPA sufficiently considered the total costs of the BPT limitations in relation to the effluent-reduction benefits and this is all that the Act requires.

2. The BCT cost-effectiveness test does not replace the BPT cost requirement.

3. Although the BPT limitations will double industry's current costs for the removal of conventional pollutants, these costs are not sufficiently high to make the Administrator's decision arbitrary or capricious; identifying the point of diminishing returns is within the discretion of the Administrator.

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[2] 606 F.2d 1068, *superseded on rehearing*, 636 F.2d 323 (D.C.Cir.1979).

B. The EPA's Definition of the BPT Data Base:

1. The EPA did not use unreasonably weak statistical editing criteria to determine the 'average of the best' dischargers in defining the BPT data base.

2. The EPA's rejection of polishing ponds and multimedia filtration as the BPT model technology was not arbitrary or capricious; the EPA determined that the benefits of polishing ponds relative to their costs were not substantial and that the effectiveness of multimedia filtration was not well demonstrated.

C. The 'Summer/Winter Issue':

The EPA's determination that neither special subcategorization nor establishing special limits was necessary for plants utilizing biological treatment systems in colder climates was not arbitrary or capricious; the record shows that the performances of such plants were comparable to those in other regions and technological modifications are available to account for the limited instances in which cold weather may affect treatment performance.

D. BPT Subcategorization:

1. The EPA's use, in part, of Standard Industrial Classification (SIC) codes for the purpose of categorizing the OCPSF industry was reasonable; because SIC codes are based on product type, the EPA could reasonably assume that plants producing similar products would have similar wastestreams.

2. The NRDC's contention that the EPA failed to provide public notice of its intent to limit the applicability of the regulations to certain SIC codes is without merit; as early as 1985 the EPA defined the OCPSF industries to include all facilities within specified SIC codes.

E. Issues Concerning Waste Stabilization Ponds:

1. The EPA's determination that pond algae are conventional pollutants is consistent with the Act, which de-

fines a conventional pollutant as a biological oxygen-demanding substance or a suspended solid.

2. The EPA's decision not to create a subcategory for plants employing waste stabilization pond treatment systems was reasonable, because the EPA determined that more effective technology was available; the EPA need not create separate subcategories for industry members that install less effective technology than the model technology.

3. The EPA adequately considered the compliance costs that will be incurred by plants utilizing pond technology.

4. The EPA's suggestion in the final regulations that copper sulfate could be used to control pond algae was in response to the industrial petitioners' comments and thus did not require further notice and comment under the Administrative Procedure Act.

5. The costs of the BPT limitations are not wholly disproportionate to its benefits.

F. Plant-Specific Challenges to the BPT Limitations and the Availability of Fundamentally-Different-Factor Variances

1. The EPA reasonably concluded that the BPT limitations for biological oxygen-demanding substances were achievable for Union Carbide's plants through the use of biological treatment.

2. The EPA reasonably concluded that the BPT limitations were achievable for Borg-Warner's plants and others with phenol-dominated wastestreams.

3. DuPont's claim that the wastestream of its Chambers Works plant is uniquely complex, precluding compliance with the BPT limitations, is not a basis for invalidating the limitations.

4. The EPA's decision not to create a separate subcategory, as urged by Ethyl and Monsanto, for plants with

high concentrations of influent total-dissolved solids was reasonable; there was insufficient evidence that any plant has enough total dissolved solids to preclude effective treatment.

5. The plant-specific challenges of Union Carbide, Borg-Warner, Dow, Monsanto, and Ethyl that their plants cannot meet the limits are without merit because the Act does not require the EPA to consider allegedly fundamentally different factors of individual plants in promulgating nationwide BPT limitations for an industry; the CWA provides that fundamentally different factors of plants that preclude compliance must be considered in a collateral variance proceeding.

III. Best Available Technology (BAT) Issues:

A. The EPA's Statistical Methodology:

1. The EPA's use of weighted averaging to derive long-term averages was not an abuse of discretion.

2. The EPA's averaging of variability factors in deriving effluent limits was not an abuse of discretion.

B. Remedy for Unavoidable Exceedances:

The EPA's decision to exclude extremely high discharges from the calculation of "variability factors" was reasonable, and the "upset defense" is a sufficient remedy for exceedances that result from exceptional circumstances beyond the control of the plant operator.

C. The EPA's Analytical Methodology:

1. The industrial petitioners failed to demonstrate that the EPA's statistical model did not account for analytical variability.

2. This court defers to the EPA's determination that the presence of multiple pollutants in a plant's waste-stream did not preclude accurate measurement of those pollutants.

3. The EPA employed reasonable criteria for the use of borrowed data when performance data for a particular pollutant were not available.

4. The EPA's error, if any, in determining "minimum analytical values" was accounted for by the EPA's conservative methodology which ensured that the limitations are achievable.

5. The industrial petitioners were not prejudiced by changes in analytical methods in the development of the OCPSF limitations.

D. Use of Minimum Analytical Values for Enforcement Purposes:

The petitioners' claim that a non-detect reading should be considered zero for enforcement purposes is not ripe for review because the EPA has not adopted a formal policy on this issue.

E. The EPA's Sampling Techniques:

1. The industrial petitioners failed to demonstrate that the effluent discharge limits were based on inaccurate EPA sampling.

F. The EPA's Application of the Limitations for Toxic Pollutants to All OCPSF Dischargers:

1. The EPA did not abuse its discretion by subjecting all OCPSF dischargers to the limits for all toxics.

2. The EPA provided adequate public notice that it was considering subjecting all dischargers to the limits for all toxics.

3. Even if this is the proper court in which to raise the issue, the EPA's limitations for toxic pollutants do not violate the consent decree in *NRDC v. Train.*

G. BAT Subcategorization:

1. The EPA violated the notice and comment requirement of the Administrative Procedure Act by failing to

publish for public comments its BAT subcategorization prior to final promulgation of the regulations.

H. DuPont's Chambers Works Plant:

1. DuPont's assertion that its Chambers Works plant will not be able to comply with the BAT limitations because of the plant's uniquely complex wastestream is not a basis for invalidating the limitations.

I. The BAT Limitations for Phenol:

1. Borg-Warner failed to demonstrate that the BAT limitations for phenol are unachievable for plants with phenol-dominated wastestreams; the record shows that such plants are capable of meeting the limitations.

2. Borg-Warner failed to demonstrate that the EPA's cost estimates were not a reasonable approximation of the costs the industry will have to incur to meet the BAT limitations.

J. The BAT_2 Limitations for Volatile Pollutants Based on Steam Stripping Technology:

1. PPG and Dow have failed to demonstrate that the BAT_2 limitations for volatile pollutants are not achievable; the record shows that at least one of the plants in the data base was able to meet the limitations for each pollutant.

2. Because the EPA determined that the limitations could be met by all plants regardless of their wastestream characteristics, the EPA did not abuse its discretion by failing to further subcategorize the plants subject to the limitations for volatile pollutants on the basis of wastestream characteristics.

3. Because the EPA determined that steam-stripper maintenance could be conducted without discharging volatile pollutants, the EPA did not abuse its discretion by failing to make an allowance for such discharge in the limitations.

4. Dow Chemical's claim that two of its plants will not be able to meet the limitations for volatile pollutants is not a basis for invalidating the limitations.

K. The BAT_2 Limitations for Priority Pollutants Based on In-Plant Biological Treatment:

1. CMA has failed to demonstrate that the EPA's reliance on data from end-of-pipe biological treatment systems in deriving the BAT_2 limitations was arbitrary or capricious.

2. CMA has failed to demonstrate that the EPA's cost estimates for in-plant biological treatment systems are not a reasonable approximation of the type and cost of the technology that industry will have to utilize to meet the limitations.

3. Contrary to CMA's assertion, the record shows that the EPA considered the land costs associated with in-plant biological treatment systems.

L. Compliance Deadline:

1. The EPA's post-deadline enforcement policy provides an adequate time extension for industry members that will not have sufficient time to install the technology required to meet the limitations.

IV. Pretreatment Standards for Existing Sources (PSES) Issues:

A. "Pass Through" Issues:

1. The EPA properly selected pollutants that pass through POTWs for the pretreatment standards.

2. The EPA's decision to define "pass through" based on POTW average removal, rather than actual reported removal, does not violate the CWA.

3. The EPA's decision not to find pass through of chromium, copper, and nickel, which contaminate sludge, was

not arbitrary or capricious because sludge pollutants will be subject to future rulemaking proceedings.

B. The EPA's failure to establish PSES for six volatile pollutants was not arbitrary or capricious because some of these pollutants were sufficiently controlled by the limits for structurally similar compounds and the EPA did not have sufficient POTW removal data to fix limits for the other pollutants.

C. Application of PSES to Small Dischargers:

1. The EPA's decision not to exempt small indirect dischargers from PSES and not to establish a different standard for these dischargers was reasonable; the record supports the EPA's determination that the economic impact of PSES on these dischargers was not so disproportionate to the impact on the industry as a whole as to require a separate subcategory.

2. The Synthetic Organic Chemical Manufacturers Association (SOCMA) failed to demonstrate that the EPA's cost projection for PSES was not reasonable.

3. The EPA reasonably rejected SOCMA's proposal that the EPA regulate only small plants producing large discharges; such a plan would leave substantial pollutant discharges unregulated.

D. Application of PSES to Paint/Resin Plants:

1. The EPA's reliance on data from resin plants in promulgating PSES does not make the standards inapplicable to combined paint/resin plants; the EPA found that the wastestreams of resin plants and paint resin plants were equally treatable.

2. The National Paint and Coatings Association has failed to demonstrate that PSES as applied to paint/resin plants are not economically achievable; the EPA identified cost-effective means of segregating the resin stream from

such plants thereby making separate regulation of the resin stream possible.

3. The EPA's regulation of the resin discharge of combined paint/resin plants does not violate the *NRDC v. Train* consent decree which exempts paint manufacturers from regulation.

4. The regulations make it clear which resin manufacturers are subject to PSES.

E. The EPA's Decision Not to Subcategorize on the Basis of POTW Removal Credits:

1. The EPA is not required to subcategorize on the basis of POTW removal credits; Congress intended that credits for a POTW's pollutant removal would be available only after the EPA completes its comprehensive sludge regulations.

2. Because Congress has suspended the removal credits regulations, this court need not address the claims of Gulf Coast Waste Disposal Authority and the Village of Sauget POTWs that they supplied the EPA with sufficient data to support their claims for removal credits or subcategorization.

3. Gulf Coast Waste Disposal Authority is bound by the consent decree in *United States v. Crown Central Petroleum Corporation* which requires Gulf Coast to recognize and enforce the pretreatment standards.

V. New Source Performance Standards (NSPS) Issues:

1. The EPA's application of BPT- and BAT-costing methods to NSPS was reasonable.

2. The EPA's failure to consider wastestream recycling as a model technology in promulgating NSPS was arbitrary; the record indicates that recycling is a well-demonstrated technology resulting in substantially higher pollutant removal.

VI. Montreal Protocol Issue:

A. The EPA's failure to consider the economic consequences of the "Montreal Protocol on Substances that Deplete the Ozone Layer" in the cost analysis of the chlorofluorocarbon industry was not arbitrary or capricious, because the issue was never brought to the EPA's attention and at the time the regulations were promulgated the Montreal Protocol was not yet in force.

VII. Issues Concerning the Scope of the OCPSF Limitations:

1. This court is without jurisdiction to review NRDC's claim that the EPA's reservation of nonconventional pollutants and eight priority pollutants for future rulemaking was contrary to the CWA; such a challenge must be raised in the first instance in the district court.

2. The EPA reasonably concluded that the OCPSF limitations apply to research as well as manufacturing discharges.

Table of Contents

Statutory Background

The purpose of the Clean Water Act (CWA) is to restore and maintain the chemical and biological integrity of the

nation's waters.[3] It was adopted to effectuate Congress's declared "national goal that the discharge of pollutants into the navigable waters be eliminated by 1985,"[4] a date later extended to March 31, 1989,[5] and to prohibit "the discharge of toxic pollutants in toxic amounts."[6]

Until 1972, the federal government relied primarily on state and local action to accomplish federal pollution-abatement goals.[7] Congress became dissatisfied, however, with the division of responsibility for setting standards between federal and state water-pollution-control agencies, with the EPA's dilatory pace, and with the ponderous federal enforcement procedure. Consequently, it enacted the Federal Water Pollution Control Act (FWPCA) Amendments of 1972,[8] which imposed greater federal regulatory responsibilities and set deadlines for the completion of limitations on pollutant effluents.

Because the EPA had failed timely to fulfill its responsibilities under the 1972 Act, the Natural Resources Defense Council (NRDC) filed suit in *NRDC v. Train* challenging the EPA's failure to promulgate the effluent standards mandated for toxic substances. The consent decree entered into by the EPA, NRDC, and various industrial intervenors in that suit established a schedule for Agency promulgation of effluent limits, new source stand-

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[3] 33 U.S.C. § 1251(a).

[4] 33 U.S.C. § 1251(a)(1).

[5] 33 U.S.C. § 1311(b).

[6] 33 U.S.C. § 1251(a)(3).

[7] 1 Grad, Treatise on Environmental Law § 3.03 at 3-71 (1988).

[8] *Id.*, § 3.03 at 3-78; Congressional Record, House Debate, Dec. 15, 1977, Report on Resolution Providing for Consideration of Conference Report on H.R. 3199, Clean Water Act of 1977, *published in* 3 Legislative History of the Clean Water Act of 1977, 299, 327 (1978), hereinafter referred to as "Legislative History."

ards, and pretreatment standards for priority toxic pollutants.[9]

Recognizing the growing seriousness of the problems created by toxic pollution and the inadequacy of the 1972 FWPCA to deal with them,[10] Congress amended that Act by adopting the CWA in 1977.[11] As thus amended, the FWPCA contains several distinct, though interlocking, regulatory schemes.

First, Title II of the Act encourages the construction of publicly-owned waste-treatment works by providing federal grants-in-aid to states for the construction of such plants.[12] As a condition of receiving grants-in-aid, the Act requires states to establish area-wide management agencies with both planning and regulatory functions for waste treatment.

The second regulatory feature of the FWPCA, as set out in Title III, authorizes the EPA to set and to enforce federal effluent standards. This part of the 1977 statute codifies the toxics consent decree issued by the United States District Court for the District of Columbia in which it required the EPA to develop BAT effluent guidelines by July 1, 1980 for 65 toxic pollutants listed in the decree. The Act also requires the EPA to promulgate pretreatment standards for indirect dischargers based on BAT or more stringent criteria.[13]

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[9] 8 Env't Rep. Cas. (BNA) 2120 (D.D.C.1976), *modified sub. nom. NRDC v. Costle*, 12 Env't Rep. Cas. (BNA) 1833 (D.D.C.1976), *modified sub. nom. NRDC v. Gorsuch*, No. 72-2153 (D.D.C.1982), *modified sub. nom. NRDC v. Ruckelshaus*, No. 73-2153 (D.D.C. Aug. 2, 1983).

[10] Leg. Hist. 326-27, 456-47, 862-65.

[11] Pub.L. No. 95-217, 91 Stat. 1566 (1977).

[12] FWPCA §§ 201-08, 211-12, 33 U.S.C. §§ 1281-88, 1291-92. *See* Grad, *supra*, § 3.03 at 3-113.

[13] 33 U.S.C. § 1317(a).

Third, the Act requires the states to establish water-quality criteria and to set ambient quality standards for each of their rivers, subject to EPA approval. This continues the procedures under prior law pursuant to which the states submitted their ambient water standards for federal approval, submitted their own effluent limitations designed to meet these standards, and had responsibility for enforcement of the limitations.[14]

To monitor compliance with the pollutant effluent limitations, the Act establishes a system for issuing pollution permits called the National Pollutant Discharge Elimination System (NPDES).[15] Each discharger, including POTWs, must obtain a permit from the EPA. No permit may be issued unless the effluent to be discharged meets federal effluent standards.[16]

As Professor Frank P. Grad has noted in his Treatise on Environmental Law, these four "regulatory schemes . . . are limited . . . by a variety of general provisions dealing with enforcement, citizen suit, judicial review, and the like."[17]

Congress again amended portions of the Act in 1987 to extend the compliance dates prescribed in the 1977 Act from July 1, 1984, to March 31, 1989; to permit modification of secondary treatment requirements to alter the guidelines applicable to facilities that are fundamentally different; and to effect other changes. Our references in this opinion to the Act refer to its provisions as finally amended in 1987.

The Act requires direct dischargers to comply with technology-based pollutant-effluent limitations that, in time, will

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[14] *Grad, supra,* § 3.03 at 3-115.

[15] 33 U.S.C. § 1342.

[16] 40 C.F.R. Part 144.

[17] *Grad, supra,* § 3.03 at 3-116.

become more stringent.[18] First, it orders all direct dischargers of conventional pollutants to comply with effluent limitations achievable by application of the *"best practicable* control *technology* presently available" (BPT) by July 1, 1977. Second, it orders all direct dischargers of conventional pollutants to comply by March 31, 1989 with effluent limitations based on a more exacting standard, the *"best conventional* pollution control *technology"* (BCT). It mandates in addition that, by the same date, direct dischargers of toxic pollutants must comply with the even more rigorous effluent limitations based on the *"best available technology* economically achievable" (BAT).[19]

The EPA must determine the BPT, BCT, and BAT requirements and announce them in regulations establishing "effluent limitations guidelines" for various classes and categories of dischargers. In establishing each set of standards Congress required the EPA to consider a number of factors including costs, although the cost factor is accorded less weight for facilities not yet constructed and for discharges more harmful to the environment.

New plants constructed after the promulgation of the OCPSF Guidelines that discharge directly into navigable waters are subject to separate standards referred to as "new source performance standards" (NSPS). The new source performance standards are based on the *"best available demonstrated control technology"* (BADCT) as identified by the EPA.[20]

Indirect dischargers rely on POTWs to treat their wastewaters, and the Act requires the EPA to set effluent limitations for POTWs engaged in the treatment of municipal sewage or industrial wastewater.[21] Although the POTW

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[18] 33 U.S.C. §§ 1311(b), 1314(b).

[19] 33 U.S.C. § 1314(b).

[20] 33 U.S.C. § 1316.

[21] 33 U.S.C. §§ 1311(b)(1)(B)-(C), 1314(d)(1).

requirements are determined by separate regulations, they must be based on BAT to ensure that all final dischargers of toxic pollutants meet the same standards. The treatment usually accorded by POTWs, however, may not remove all pollutants discharged into their facilities by industrial users and their operation of these facilities may be damaged by some industrial discharges. Therefore, to regulate the discharge into POTWs of those pollutants determined "not to be susceptible to treatment" by POTWs or likely to "interfere with the operation" of POTWs,[22] the Act requires the EPA to establish *"pretreatment standards for existing sources"* (PSES). These standards must also be based on BAT.[23]

The OCPSF limitations are technology-based and apply to plants grouped into categories based on their industrial characteristics. The EPA, with the concurrence of the state affected, may establish special provisions for a facility that is fundamentally different with respect to one or more of the factors relevant in developing the regulations other than cost. These provisions, which are known as "fundamentally different factor" (FDF) variances, are intended to adjust the general limitations and provide different ones for a plant whose individual characteristics prevent it from performing within the limits set for its industrial category.[24] An FDF variance application may be based on supporting data submitted to the EPA during the rulemaking process or on information that the applicant did not have a reasonable opportunity to submit at that time.[25]

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[22] 33 U.S.C. § 1317.

[23] 33 U.S.C. § 1317(b)(1).

[24] 40 C.F.R. Part 125 Subpt. D.

[25] 33 U.S.C. § 1311(n)(1).

The regulatory process is not static. Various provisions of the Act require the EPA to review the guidelines periodically and to revise them when appropriate.[26]

For the past eleven years the EPA has conducted studies and rulemaking proceedings for the purpose of establishing OCPSF pollutant-effluent limitations. The EPA has identified model technologies that in its view satisfy the development criteria for BPT, BAT, NSPS, and PSES. Based on these model technologies, the EPA has determined treatment performances and has established effluent limitations for conventional and toxic pollutants within the range of the performances achieved by the model technologies. The OCPSF limitations provide maximum daily and maximum monthly average limits for the discharge of designated pollutants from each "point source," that is, each discharge pipe.[27]

Standards of Review

The Administrative Procedure Act (APA) fixes the standard for appellate review of agency actions. Agency actions may be set aside only if the "agency action, findings, and conclusions [are] found to be . . . arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law"; or "in excess of statutory jurisdiction, authority, or limitations, or short of statutory right"; or "without observance of procedure required by law."[28] In making its determinations, "the court shall review the whole record or those parts of it cited by a party, and due account shall be taken of the rule of prejudicial error."[29]

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[26] *See, e.g.*, 33 U.S.C. § 1314(b) (annual revision); § 1316(b) (revision "from time to time"); § 1317(a)(3) (revision "every three years").

[27] 52 Fed.Reg. 42,522. (codified at 40 C.F.R. Part 414).

[28] 5 U.S.C. § 706.

[29] 5 U.S.C. § 706, ¶ 2.

The many issues raised on appeal concern three aspects of the EPA's actions, each governed by different standards: (1) its rulemaking procedures; (2) its interpretation of the Clean Water Act; and (3) the validity of its regulations and its actions to enforce the Act.

The standards of review for each of these types of issues have been stated and restated in a host of cases, not always consistently. The most frequently stated verbal formulae are these:

Review of the validity of the challenged procedure is a question of law governed principally by the APA, under which our review is plenary. In determining validity, the Administrator's decision is entitled to a presumption of regularity.[30] A party petitioning for review of an agency's regulations bears the burden of overcoming this presumption.[31]

When we turn to the EPA's interpretation of the statute, our review is again plenary, for we may not accept its interpretation if "contrary to Congress's intentions as revealed by the Act's language, structure, and legislative history."[32] In statutory interpretation, the judiciary is " 'the final authority and we must reject administrative constructions which are contrary to clear congressional intent.' "[33] Nevertheless, we accord some deference to the Agency's interpretation of the statute whose enforcement is en-

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[30] *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 415, 91 S.Ct. 814, 823, 28 L.Ed.2d 136 (1971).

[31] *See Louisiana Environmental Society v. Dole*, 707 F.2d 116, 119 (5th Cir.1983).

[32] *Ezzon Corp. v. Train*, 554 F.2d 1310, 1322 (5th Cir.1977); *see Sierra Club v. Train*, 557 F.2d 485, 489 (5th Cir.1977).

[33] *Immigration and Naturalization Service v. Cardoza-Fonseca*, 480 U.S. 421, 107 S.Ct. 1207, 94 L.Ed.2d 434 (1987) (quoting *Chevron, USA, Inc. v. NRDC*, 467 U.S. 837, 843 n. 9, 104 S.Ct. 2778, 2781 n. 9, 81 L.Ed.2d 419 (1985).

trusted to it if Congressional intention is not pellucid.[34] If, therefore, the statute is susceptible to more than one interpretation, we must accept that of the EPA if it is reasonable.[35] We need not find that it is the only permissible interpretation, but merely that the "EPA's understanding of this very 'complex statute' is a sufficiently rational one to preclude a court from substituting its judgment for that of the EPA."[36] According deference to an agency, however, does not imply "rubber stamping" its decision.[37]

In interpreting the Act, we do not lack precedent. The Supreme Court has twice considered issues involving its construction,[38] and eight circuit courts have done so in at least twenty-seven cases.[39]

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[34] *EPA v. National Crushed Stone Ass'n*, 449 U.S. 64, 83, 101 L.Ed.2d 268 (1980); *United States v. Riverside Bayview Homes, Inc.*, 474 U.S. 121, 106 S.Ct. 455, 88 L.Ed.2d 419 (1985).

[35] *Chevron, USA, Inc. v. NRDC*, 467 U.S. 837, 844, 104 S.Ct. 2778, 2782, 81 L.Ed.2d 694 (1987); *see also United States v. Ethyl Corp.*, 761 F.2d 1153, 1157 (5th Cir.1985), *cert. denied*, 474 U.S. 1070, 106 S.Ct. 830, 88 L.Ed.2d 801 (1986); *Texas v. United States*, 756 F.2d 419, 425 (5th Cir.), *cert. denied*, 474 U.S. 843, 106 S.Ct. 129, 88 L.Ed.2d 106 (1985); *City of Seabrook v. EPA*, 69 F.2d 1349, 1354 (5th Cir.1981), *cert. denied*, 459 U.S. 822, 103 S.Ct. 51, 74 L.Ed.2d 57 (1982).

[36] *Chemical Mfrs. Ass'n v. NRDC*, 470 U.S. 116, 125, 105 S.Ct. 1102, 1107, 84 L.Ed.2d 90 (1985); *see also Chevron v. NRDC*, 467 U.S. 842-45, 104 S.Ct. at 2781-83.

[37] *Bureau of Alcohol, Tobacco and Firearms v. Federal Labor Relations Authority*, 464 U.S. 89, 104 S.Ct. 439, 444, 78 L.Ed.2d 195 (1983); *NLRB v. Brown*, 380 U.S. 278, 291, 85 S.Ct. 980, 988m 13 L.Ed.2d 839 (1965).

[38] *Chemical Mfrs. Ass'n v. NRDC*, 470 U.S. at 116, 105 S.Ct. at 1102; *EPA v. National Crushed Stone Ass'n*, 449 U.S. at 64, 101 S.Ct. at 295.

[39] *See Armco, Inc. v. EPA*, No. 88-3070, ___ F.2d ___ slip op. (6th Cir. March 15, 1989); *NRDC v. EPA*, 863 F.2d 1420 (9th Cir.1989) (oil and gas industry); *American Petroleum Inst. v. EPA*, 858 F.2d 261 (5th Cir.1988) (oil and gas industry); *Texas Municipal Power Agency v. EPA*, 836 F.2d 1482 (5th Cir.1988) (electric utility industry); *American*

After interpreting the statute according to these principles, we must next determine whether the EPA's findings or the regulations based on them are "arbitrary or capricious." In doing so we must conduct a "searching

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Petroleum Inst. v. EPA, 787 F.2d 965 (5th Cir.1986) (oil and gas industry); *Kennecott v. EPA*,780 F.2d 445 (4th Cir.1985) (nonferrous metals manufacturing industry), *cert. denied*, 479 U.S. 814, 107 S.Ct. 67, 93 L.Ed.2d 25 (1986); *Cerro Copper Products Co. v. Ruckelshaus*, 766 F.2d 1060 (7th Cir.1985) (copper-forming industry); *Reynolds Metals Co. v. EPA*, 760 F.2d 549 (4th Cir.1985) (metal and brewing industries); *National Ass'n of Metal Finishers v. EPA*, 719 F.2d 624 (3d Cir.1983) (electroplating industry), *rev'd on other grounds sub nom. Chemical Mfrs. Ass'n v. NRDC*, 470 U.S. 116, 105 S.Ct. 1102, 84 L.Ed.2d 90 (1985); *American Petroleum Inst. v. EPA*, 661 F.2d 340 (5th Cir.1981) (oil and gas industry); *American Paper Inst. v. Train*, 660 F.2d 954 (4th Cir.1981) (paper industry); *Association of Pacific Fisheries v. EPA*, 615 F.2d 794 (9th Cir.1980) (seafood processing industry); *BASF Wyandotte Corp. v. Costle*, 598 F.2d 637 (1st Cir.1979) (organic pesticide industry), *cert. denied*, 444 U.S. 1096, 100 S.Ct. 1063, 62 L.Ed.2d 784 (1980); *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011 (D.C. Cir.1978) (pulp and paper industry)' *American Iron & Steel Inst. v. EPA*, 568 F.2d 284 (3d Cir.1977) (iron and steel industry); *Marathon Oil Co. v. EPA*, 564 F.2d 1253 (9th Cir.1977) (oil and gas industry); *American Paper Inst. v. Train*, 543 F.2d 328 (D.C. Cir.1976) (paper and pulp industry), *cert. dismissed*, 429 U.S. 967, 97 S.Ct. 398, 50 L.Ed.2d 335 (1976); *E.I. du Pont de Nemours & Co. v. Train*, 541 F.2d 1018 (4th Cir.1976) (inorganic chemical manufacturing industry), *rev'd in part on other grounds*, 430 U.S. 112, 97 S.Ct. 965, 51 L.Ed.2d 204 (1977); *Tanners' Council of America, Inc. v. Train*, 540 F.2d 1188 (4th Cir.1976) (leather tanning industry); *American Petroleum Inst. v. EPA*, 540 F.2d 1023 (10th Cir.1976) (oil and gas industry),*cert. denied*, 430 U.S. 922, 97 S.Ct. 1340, 51 L.Ed.2d 601 (1977); *FMC Corp. v. Train*, 539 F.2d 973 (4th Cir.1976) (plastic and synthetic materials industries); *American Frozen Food Inst. v. Train*, 539 F.2d 107 (D.C.Cir.1976) (frozen potato products); *Hooker Chemicals & Plastics Corp. v. Train*, 537 F.2d 620 (2d Cir.1976) (phosphorus manufacturing); *American Iron & Steel Inst. v. EPA*, 526 F.2d 1027 (1975) (iron and steel industry), *cert. denied*, 435 U.S. 914, 98 S.Ct. 1467, 55 L.Ed.2d 505 (1978); *American Meat Inst. v. EPA*, 526 F.2d 442 (7th Cir.1975) (meat products); *CPC Int'l, Inc. v. Train*, 515 F.2d 1032 (8th Cir.1975) (corn wet milling); *Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375 (D.C.Cir.1973) (cement manufacturers industry), *cert. denied*, 417 U.S. 921, 94 S.Ct. 2628, 41 L.Ed.2d 226 (1977).

and careful review" of the facts to determine whether "the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment."[40] As a reviewing court, however, we must not "substitute [our] judgment for that of the agency,"[41] but must "start with the assumption that the agency's action is valid."[42] The court's proper function is only to determine whether the agency has "considered the relevant factors and articulated a rational correlation between the facts found and the choice made."[43]

An agency rule is "arbitrary" if the agency has "relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise."[44]

Because "technological and scientific issues such as those presented in [reviewing effluent limitations] are by their very nature difficult to resolve by traditional principles of judicial decisionmaking,"[45] the court " 'must look at the [agency's] decision not as the chemist, biologist or statistician that [it is] qualified neither by training nor ex-

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[40] *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. at 416, 91 S.Ct. at 824.

[41] *Id.*

[42] *Avoyelles Sportsmen's League, Inc. v. Marsh*, 715 F.2d 897, 904 (5th Cir.1983).

[43] *Baltimore Gas & Electric Co. v. NRDC*, 462 U.S. 87, 105, 103 S.Ct. 2246, 2256, 76 L.Ed.2d 437 (1983).

[44] *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Automobile Ins. Co.*, 463 U.S. 29, 43 103 S.Ct. 2856, 2867, 77 L.Ed.2d 443 (1983).

[45] *Reynolds Metals Co. v. EPA*, 760 F.2d 549, 558- 559 (4th Cir.1985).

perience to be, but as a reviewing court exercising . . . certain minimal standards of rationality.' "[46]

Even with regard to complex technical or scientific decisions, however, a reviewing court may not simply defer to an agency's expertise, but must "steep" itself in technical matters sufficiently to determine whether the agency "has exercised reasoned discretion."[47] Because judicial review "must be based on something more than trust and faith in EPA's experience,"[48] a court may not respond to claims of technical expertise by "rubber stamping" an agency decision as correct.[49]

These formulae, however, ultimately may prove to be deceptive guides. The Supreme Court's decisions seem to embody two different approaches that are, "analytically in conflict 'with the result that a court of appeals must choose the one it deems more appropriate for the case at hand.' "[50] In determining the degree of deference appropriate to an agency's decision, the factors to be considered include the fact-law dichotomy, despite the difficulty of drawing a pre-

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[46] *American Paper Inst. v. EPA*, 660 F.2d 954, 963 (4th Cir.1981) (quoting *Ethyl Corp. v. EPA*, 541 F.2d 1, 36 (D.C.Cir.1976)).

[47] *Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375, 402 n. 20 (D.C.Cir.1973), *cert. denied*,417 U.S. 921, 94 S.Ct. 2628, 41 L.Ed.2d 226 (1974); *see South Terminal Corp. v. EPA*, 504 F.2d 646, 663-66 (1st Cir.1974).

[48] *Appalachian Power Co. v. Train*, 545 F.2d 1351, 1365 (4th Cir.1976).

[49] *American Petroleum Inst. v. EPA*, 661 F.2d at 348-49.

[50] *H. Craft Clothing Co. v. NLRB*,660 F.2d 910, 913-914 (3d Cir.1981) (quoting *Pittston Stevedoring Corp. v. Dellaventura*, 544 F.2d 35, 49 (2d Cir.1976), *aff'd sub nom. Northeast Marine Terminal Co. v. Caputo*, 432 U.S. 249, 97 S.Ct. 2348, 53 L.Ed.2d 320 (1977)). *See also* R. Pierce, S. Shapiro, and P. Verkuil, Administrative Law & Process (1985) § 7.5 at 377.

cise line between fact and law;[51] whether the question to be decided is one concerning which the courts have a special competence, such as constitutional law, or one that turns on technical expertise of the kind the agency staff possess;[52] whether the issue turns on the agency's interpretation of its own authorizing statute, which entitles it at least to guarded deference;[53] and the validity of the reasoning upon which the agency relies to justify its actions.[54]

Either the application of these formulae or the balancing of factors praised by scholars leaves the reviewing court with a wide margin for decision. Any approach permits different possible decisions on the various issues. Our duty requires us to resolve them with the good judgment that the latitude afforded the court demands. In performing this duty, we recognize our own limitations in assessing policy decisions.[55]

I. *Procedural Challenges*

1. The EPA's Economic-Impact Study

The Clean Water Act explicitly requires the EPA to consider economic achievability in formulating pollutant effluent limitations.[56] The Chemical Manufacturers Association (CMA) contends that, in preparing its economic-impact study, the EPA departed from its prior practice during

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[51] *H. Craft Clothing Co.*,660 F.2d at 914 (citing W. Gellham & C. Byse, Administrative Law 251-257 (7th ed. 1979)); *see also* K. Davis, Administrative Law of the Seventies § 80 (1976).

[52] *H. Craft Clothing Co.*, 660 F.2d at 915.

[53] *Id.* at 915-16.

[54] Pierce, Shapiro, and Verkuil, Administrative Law and Process § 7.5 at 377.

[55] *Id.*, § 7.6 at 391-2; G. Robinson, E. Gellhorn, and H. Bruff, The Administrative Process (3d ed. 1986) § 684.

[56] 33 U.S.C. §§ 1314(b)(1)(B), 1314(b)(2)(B), and 1314(b)(4)(B).

the rulemaking proceedings and violated the APA's notice-and-comment requirement by relying on economic data obtained from Dun & Bradstreet that were never made available to the public for comment.

The APA requires an agency to set forth in its notice of proposed rulemaking "the terms or substance . . . or a description of subjects and issues involved" in the proposed rule.[57] The agency must then give interested persons an opportunity to participate in rulemaking through criticism and comments.[58] Although the APA does not specifically require notice and comment on the technical data that an agency considers, this court has recognized that fairness requires that the agency afford interested parties an opportunity to challenge the underlying factual data relied on by the agency.[59]

If the final rules differ from the proposed rules or if new data are considered after the agency receives comments on the data it initially provides, the nature of the change in the proposed rule or in the newly-considered data determines whether it must again publish notice and invite additional comments. As the District of Columbia Circuit noted in *Air Transport Association of America v. Civil Aeronautics Board:*

> An agency adopting final rules that differ from its proposed rules is required to renotice when the changes are so major that the original notice did not adequately frame the subjects for discussion. . . . The agency need not renotice changes that follow logically

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[57] 5 U.S.C. § 553(b)(3).

[58] 5 U.S.C. § 553(c).

[59] *See Air Products & Chemicals, Inc. v. FERC,* 650 F.2d 687, 700 n. 17 (5th Cir.1981) (citing K. Davis, Administrative Law Treatise, § 7:17 at 530 (2d ed. 1978)).

> from or that reasonably develop the rules it proposed originally[60]

In that case, the CAB had promulgated a final fee schedule relying on internal staff studies that had not been made available for comment but that had been prompted by prior public comments that had "strongly challenged" calculations in the proposed fee schedule. The court found no notice-and-comment violation because the agency had in its notice of proposed rulemaking both outlined the method that it proposed to use and indicated the type of actions it proposed to take. The District of Columbia Circuit concluded that "[t]hese critical elements of the proposal did not change, and the final rule was a 'logical outgrowth' of the proposed rule."[61]

In *Community Nutrition Institute v. Block*[62] the same court considered the situation in which the agency did not make a change in the proposed rule but considered new and unpublished data after giving notice. The court noted that the Secretary of Agriculture had requested further information on the subject of a proposed rule and that the petitioner in response then pointed out a possible methodological flaw in the studies relied on by the Secretary but did not provide the requested information. The Secretary then relied on two supplemental staff studies that were developed after the close of the comment period to address the alleged flaw. These studies were not made available for comment. The court said: "Rulemaking proceedings would never end if an agency's response to com-

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[60] 732 F.2d 219, 224 (D.C.Cir.1984) (quoting *Connecticut Light and Power Co. v. Nuclear Regulatory Commission*, 673 F.2d 525, 533 (D.C.Cir.), *cert. denied*, 459 U.S. 835, 103 S.Ct. 79, 74 L.Ed.2d 76 (1982)).

[61] *Id.*

[62] 749 F.2d 50, 57-58 (D.C.Cir.1984).

ments must always be made the subject of additional comments."[63]

In a 1986 notice of availability the EPA announced that it intended to prepare an economic-impact study of the OCPSF pollutant effluent limitations. The EPA stated that in preparing the economic-impact study it would rely on an industry-wide "FIN/STAT" data base that covered the period from 1976-81.

Industry members commented that the FIN/STAT data base was outdated and did not have adequate data for plants whose sales exceeded $10 million annually. In the preamble to the final rules the EPA announced that, in response to industry comments, "the financial data base used to calculate discounted cash flow and liquidation values for OCPSF plants in the impact analysis was changed from FIN/STAT to Dun & Bradstreet," but it did not reveal the new Dun & Bradstreet data. These data, however, were edited in the same manner as the older Dun & Bradstreet data used in the FIN/STAT study.[64] The EPA further stated in the preamble that it used the later Dun & Bradstreet data to increase the size of the entire data base, to increase the number of plants in the "greater than $10 million sales" category (from 4 to 73), and to update the data base to cover the period from 1981 to 1986.[65]

The new Dun & Bradstreet data were used to estimate plants' cash flow, liquidation value, and profits. Although these data were important in the economic-impact study, the EPA also relied on data that had earlier been obtained from other sources, including material from Robert Morris Associates, COMPUSTAT, Data Resources, Inc., the Bureau of Economic Analysis, the Bureau of Labor Statistics,

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[63] *Id.*

[64] 42 Fed.Reg. 42,550.

[65] *Id.*

the International Trade Commission, the Bureau of the Census, chemical-industry periodicals, and surveys submitted to plants under Section 308 of the CWA. The EPA did not supplant its economic-impact study, or replace its original data with completely new and different data, but, in response to industry criticisms, updated and expanded one of several data sources. Indeed, the data it originally relied on were not so scanty that a reasonable rulemaker could not have relied upon them.

The 1986 notice adequately advised interested parties of the method the EPA had followed, the financial data it proposed to rely on, and its intention to develop an economic-impact study. The EPA's use of the updated and expanded Dun & Bradstreet data base was a logical and reasonable development based on industry comments and as such did not require further notice and comment.

In any event, CMA has failed to demonstrate that it was prejudiced by the EPA's use of the new Dun & Bradstreet data.[66] The APA provides that a reviewing court shall take due account of "the rule of prejudicial error."[67] The rule applies "when a mistake of the administrative body is one that clearly had no bearing on the procedure used or the substance of the decision reached."[68] A petitioner who objects to an agency's failure to publish data for comment must "indicate with 'reasonable specificity' what portions of the document it objects to and how it might have responded if given the opportunity."[69]

The EPA offered to make the new Dun & Bradstreet data available to CMA during the post-rulemaking period

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[66] *See Air Transport Ass'n*, 732 F.2d at 224 n. 11; *Community Nutrition Inst.*, 749 F.2d at 58.

[67] 5 U.S.C. § 706.

[68] *U.S. Steel Corp. v. EPA*, 595 F.2d 207, 215, *reh'g granted in part on other grounds*, 598 F.2d 915 (5th Cir.1979).

[69] *Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 540-41 (D.C.Cir.1983) (citation omitted).

on a confidential basis, explaining that it had failed to publish the data because its contract with Dun & Bradstreet required it to keep the data confidential. While a contractual provision of this sort cannot, absent unusual circumstances, relieve an agency of its duty to publish data, the EPA offer did make it possible for CMA to review the data, to comment on it on an "in camera" basis to this court, and to demonstrate that the data were sufficiently inaccurate or misleading to prejudice the affected industries. CMA declined the EPA's offer. In response to direct inquiry by this court, the only prejudice CMA has suggested is that it lacked an opportunity to show that the OCPSF effluent limitations were not economically achievable. Because CMA was fully able to make this showing even without the Dun & Bradstreet data, we fail to discern any substantial prejudice from the EPA's use of the 1981-86 Dun & Bradstreet data to supplement the other information on which it relied. We therefore decline to overturn the regulations because of the EPA's use of undisclosed supplementary economic data from Dun & Bradstreet.

2. Limits on Metal-Bearing Wastestreams

Appendix A to the effluent limitations establishes limits for the discharge of toxic uncomplexed metals. Appendix B lists "complexed metals," that is, metals bonded with an organic molecule, and states that limits for such pollutants will be established on a case-by-case basis.[70] CMA and DuPont content that Appendices A and B were never presented to the public for comment, this violated the APA's notice and comment requirement, and the limitations in these appendices therefore are unlawful.

In a 1985 public notice the EPA proposed BAT limits for all metals found in OCPSF wastestreams. In response

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[70] 52 Fed.Reg. 42,542-43.

to EPA's notice several industry members commented that few OCPSF wastestreams contained metals and that the model technology chosen by EPA to treat toxic metals was not effective in removing complexed metals. In a 1986 public notice the EPA requested additional OCPSF industry information concerning removal of complexed and uncomplexed metals, the source of metals in OCPSF wastestreams, whether each metal is complexed or uncomplexed, and, for complexed metals, a list of the complexing agents.[71] In Appendix A to the final rule, the EPA listed industrial processes likely to produce metal-bearing wastestreams and established effluent limitations for the discharge of such metals. In Appendix B the Agency listed the processes that produce complexed metals and stated that such metals would be regulated on a case- by-case basis when individual NPDES permits were issued.[72]

The APA notice requirement is satisfied if the notice fairly apprises interested persons of the subjects and issues the agency is considering; "the notice need not specifically identify 'every precise proposal which [the agency] may ultimately adopt as a final rule.' "[73] Though the EPA did not give the industry notice of Appendices A and B, the 1985 and 1986 notices informed the industry that the Agency was considering establishing limitations for complexed and uncomplexed metals, and this was all the APA demands. Moreover, the changes reflected in the final rule were instigated by industry comments and were based on data supplied by the industry; thus the final rule was a logical outgrowth of the comments received.

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[71] 51 Fed.Reg. 44,090-91.

[72] 52 Fed.Reg. 42,542-43.

[73] *United Steelworkers of America v. Schuylkill Metals*, 828 F.2d 314, 317 (5th Cir.1987) (citations omitted).

II. *Best Practicable Technology (BPT) Issues*

The CWA authorizes the EPA to establish effluent limitations for direct dischargers of conventional pollutants. The Administrator is required to establish effluent limitations for categories or classes of point sources discharging these pollutants based on the "best practicable control technology currently available" (BPT).[74] The CWA does not specifically define BPT, but does identify factors that the EPA should consider in determining it.

Section 304(b) of the CWA, as amended, states that in assessing BPT, the EPA must consider:

> the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application, and shall also take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact . . . and such other factors as the Administrator deems appropriate. . . .[75]

BPT limitations are intended to represent the average of the best levels of performance by existing plants of various sizes, ages, and unit processes within the category or subcategory for control of conventional pollutants.[76] In promulgating the regulations, the Agency identified a model technology: biological treatment preceded by appropriate process controls and in-plant treatment followed by secondary clarification as necessary to assure adequate control of solids.[77] CMA argues that the EPA's data indicate

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[74] 33 U.S.C. §§ 1311(b)(1)(A), 1314(b)(1)(A).

[75] 33 U.S.C. § 1314(b)(1)(B) (1986).

[76] *See* 52 Fed.Reg. 42,525.

[77] *Id.* at 42,534.

that its limitations will require the installation of additional treatment equipment at a cost "wholly out of proportion" to the marginal effluent reduction that the equipment would achieve and that the limitations consequently fail to meet the cost-effectiveness test required by Section 304(b)(1)(B) of the Act and the "best conventional technology" (BCT) test enacted in 1977. The EPA asserts that the total cost of the BPT rules is justified by the total amount of pollutant that would be removed.

A. The EPA's Consideration of the Industry's Costs of Complying With the BPT Limitations

CMA maintains that the cost-effectiveness of BPT rulemaking should be measured by a "knee-of-the-curve" test to determine the point at which costs rise steeply per pound of pollutant removed and that, under such a test, the BPT rules are not cost- effective.

The CWA contains no specific statutory language establishing a BPT "knee-of-the-curve" test or any other quantitative cost-benefit ratio test for BPT. The statute simply requires that the EPA consider "the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application."[78] The courts of appeal have consistently held that Congress intended Section 304(b) to give the EPA broad discretion in considering the cost of pollution abatement in relation to its benefits and to preclude the EPA from giving the cost of compliance primary importance.[79]

Senator Muskie, the principal Senate sponsor of the Act and the Chairman of the Senate Subcommittee on Air and Water Pollution, stated:

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[78] 33 U.S.C. § 1314(b)(1)(B).

[79] *American Iron & Steel Inst. v. EPA*, 526 F.2d at 1051; *accord FMC Corp. v. Train*, 539 F.2d at 978-79; *BASF Wyandotte Corp.*, 598 F.2d at 656-57; *Kennecott Copper Corp. v. EPA*, 612 F.2d 1232, 1238 (10th Cir.1979).

> The balancing test between total cost and effluent reduction benefits is intended to limit the application of technology only where the additional degree of effluent reduction is wholly out of proportion to the costs of achieving such marginal level of reduction for any class or category of sources.
>
> The Conferees agreed upon this limited cost-benefit analysis in order to maintain uniformity within a class and category of point sources subject to effluent limitations, and to avoid imposing on the Administrator any requirement to consider the location of sources within a category or to ascertain water quality impact of effluent controls, or to determine the economic impact of controls on any individual plant in a single community.[80]

The EPA argues that the Administrator acted well within this broad discretion in concluding that the costs of the OCPSF BPT limitations were justified by the significant quantities of pollutants that would be removed.[81] The EPA notes that the OCPSF industry is currently a national leader in discharging conventional pollutants into our nation's waters. The industry has approximately 300 direct dischargers which annually discharge an estimated 61 million pounds of biochemical oxygen-demanding substances (BODS) and 100 million pounds of total suspended

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[80] 1972 Leg.Hist. at 170. *See EPA v. National Crushed Stone Assoc.*, 449 U.S. at 71 n. 10, 101 S.Ct. at 300 n. 10; *American Frozen Food Inst. v. Train*, 539 F.2d at 119. The Ninth Circuit has interpreted this legislative history to prohibit EPA from relying upon a cost-benefit comparison to select a lower level of technology than BPT unless increased costs would be wholly disproportionate to potential effluent reduction benefits. *Association of Pacific Fisheries v. EPA*, 615 F.2d at 805.

[81] 52 Fed.Reg. at 42,537. EPA also determined that no plants would close, no product lines would be discontinued, and no jobs would be lost as a result of implementing the BPT limits. *Id.* at 42,551.

solids (TSS) for a total estimate of approximately 161 million pounds annually.[82] The EPA estimated that the BPT limitations would result annually in the removal of 108 million pounds of conventional pollutants from OCPSF discharges and consequently from our nation's waters[83] at an annualized compliance cost of 76.6 million dollars after a capital investment of 215.8 million dollars.[84] Thus, the EPA concluded that the total cost of BPT is warranted by the total pounds of pollutant removed.

1. Knee-of-the-Curve Test

CMA argues that Congress was concerned generally that the EPA's regulations not require expenditures that would pass the point at which costs escalate rapidly in relation to benefits—the "knee-of-the-curve" on a diagram depicting the cost curve. CMA conceives of the knee-of-the-curve test as a generally applicable cost-effectiveness test with the "knee" defining the most stringent level of regulation permissible. Thus, CMA asserts, whether the EPA labels its regulations BPT or BCT, the EPA is required to consider whether the marginal costs exceed the marginal benefits of the rule. Appiying this test, CMA argues that increasing the removal of conventional pollutants from 96 to 99 percent as required by the limitations would cost the OCPSF industry almost twice as much per pound of pollutant removed as current treatment methods: The annual removal of 108 million pounds would cost 76 million dollars per year—71 cents per pound—whereas industry efforts to date have required an expenditure of only 38 cents per pound. CMA concludes that the cost per pound for removal of pollutants is thus well beyond the knee-of-the-curve and that the regulations are therefore not cost-effective.

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[82] 52 Fed.Reg. at 42,530.

[83] *Id.*

[84] *Id.* at 42,537.

The EPA argues, however, that even if the knee-of-the-curve test applies to any of its regulations, the test is applicable only to assess the cost-effectiveness of incremental increases in limitations *beyond* BPT—that is, only to BCT.[85] Representative Roberts, the author of the conference report on the 1977 amendments, emphasized that the additional technology requirements of BCT were to be imposed only to remove additional "cheap pounds" of conventional pollutants beyond BPT.[86] Congress, however, did not specify that initial BPT must be "cheap." In fact, Congress anticipated that BPT might cause many plant closures and the loss of 50,000 to 125,000 jobs.[87]

The BCT provisions were intended to establish an intermediate level between BPT and the stricter BAT limitations for conventional pollutants by adding a cost-effectiveness test for incremental technology requirements that exceed BPT technology.[88] Under BCT, additional limitations on conventional pollutants that are more stringent than BPT can be imposed only "to the extent that the increased cost of treatment [would] be reasonable in terms of the degree of environmental benefits."[89]

Thus, Congress intended that cost would occupy a different role in EPA's promulgation of BPT limitations than it would in the promulgation of BCT because of the different aims of the two standards. While Congress did not consider cost to be irrelevant to BPT, it clearly intended it to be a less significant factor than in the promulgation

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[85] *See* 33 U.S.C. § 1314(b)(4)(B). This statute does not establish a BCT knee-of-the-curve test; the basis for articulating this assertedly necessary test is a floor remark by Representative Roberts. 1977 Leg.Hist. at 330.

[86] 1977 Leg.Hist. at 330.

[87] 1972 Leg.Hist. at 523.

[88] *American Paper Inst. v. Train*, 660 F.2d at 937-58.

[89] 1977 Leg.Hist. at 369.

of BCT limitations. The EPA's interpretation of the Act is clearly rational and supported by both the legislative history and the case law insofar as the EPA emphasizes that the BPT limitations are not subject to the type of stringent cost-benefit analysis required by BCT. The relevant inquiry with respect to BPT, as indicated above, is whether the costs are "wholly disproportionate" to the benefits.

To the extent that CMA's claim is that "wholly disproportionate" is to be measured by a knee-of-the-curve test, the EPA responds that CMA misconceives the nature of the test. Rather than displaying the rate at which costs increase relative to pounds of pollutant removed, CMA's curve displays the rate at which the cost-per-pound increases relative to the *percent* of pollutant removed, resulting in a misleadingly steep curve. While both the BPT and BCT tests require a comparison between costs and effluent reduction,[90] neither test requires the comparison of costs to the percentage removed, as implied by CMA's curve.

CMA relies upon legislative history to justify its percent-removal approach to evaluating the reasonableness of costs. However, the statute does not require that a percent-removal approach be used to establish BPT regulations.[91] Almost all of the BPT regulations promulgated by the EPA since the 1972 enactment of the Clean Water Act are based upon either concentration limitations (as in the case of the OCPSF rule) or more stringent "mass limitations" which limit both concentrations and flow volumes.[92] In the current case, the regulation will require a

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[90] 33 U.S.C. §§ 1314(b)(1)(B), 1314(b)(4)(B).

[91] *American Paper Inst. v. Train*, 543 F.2d at 342, 345. In any event, the courts have upheld BPT regulations that resulted in 98.5% removal where average industry removal was already 95.4%. *See American Meat Inst. v. EPA*, 526 F.2d at 462.

[92] *See generally* 40 C.F.R. Parts 405-71.

10% increase above current industry costs to remove 108 million additional pounds.[93] The EPA reasonably concluded that these costs were not "wholly disproportionate" to the benefits.

2. The BCT Cost-Effectiveness Test

CMA also argues that whether or not BPT rules are, as a general matter, subject to a knee-of-the-curve test, the EPA's BPT limitations for conventional pollutants must pass the BCT cost test which Congress enacted in 1977.[94]

In promulgating BCT limitations, the Act directs the EPA to consider:

> the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived, and the comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources. . . .[95]

CMA contends that this test governs the BPT rules because they represent an increase in regulation over the limitations established on a case-by-case basis by NPDES permits issued before 1977. In other words, CMA contends that the permit limitations established BPT for individual plants and that in enacting the BCT requirements in 1977 Congress intended that any subsequent, more stringent

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[93] *See* 52 Fed.Reg. 42,551. The capital and annualized costs of complying with the BPT limitations are $215.8 and $76.6 million respectively and affect 214 plants. No plant closures are expected and seventy-eight plants are not expected to incur incremental costs. No job losses are anticipated.

[94] 33 U.S.C. § 1314(b)(4)(A).

[95] 33 U.S.C. § 1314(b)(4)(B).

regulations must be evaluated according to the BCT standards.

The EPA responds, however, that its authority to promulgate BPT regulations is not abrogated by the fact that, pursuant to Section 402(a)(1),[96] NPDES permits were issued prior to the promulgation of industry-wide BPT regulations. The EPA notes that, since 1977, it has promulgated BPT regulations limiting conventional pollutants in the iron and steel, metal finishing, coal mining, oil and gas, battery manufacturing, plastics molding and forming, metal molding and casting, coil coating, porcelain enameling, aluminum forming, copper forming, electrical and electronic products, and nonferrous metals forming industries[97]—notwithstanding the fact that most of these facilities had previously been regulated by permits. The oil-and-gas-pollutant effluent limitations were promulgated in 1979 and reviewed by this court in 1981 without any reference to the BCT cost test.[98]

The EPA also maintains that Congress did not intend BCT to displace BPT. The EPA notes that Congress has never repealed the BPT factors as a vital and continuing requirement of the Act[99] and has not stripped the EPA of its explicit authority, under Section 304(b) of the Act, to revise or update BPT periodically. Section 304(b) directs the EPA to "publish . . . regulations, providing guidelines for effluent limitations, and at least annually thereafter, revise, if appropriate, such regulations."[100] Thus, as the EPA interprets the Act, BCT standards, which place cost-effectiveness constraints on incremental technology re-

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[96] 33 U.S.C. § 1342(a)(1).

[97] 40 C.F.R. Parts 420, 433, 434, 435, 461, 463-69 and 471.

[98] *American Petroleum Inst. v. EPA*, 661 F.2d 340 (5th Cir.1981).

[99] *Chemical Mfrs. Ass'n v. NRDC*, 470 U.S. at 128 n. 18, 105 S.Ct. at 1109 n. 18.

[100] 33 U.S.C. § 1314(b).

quirements that exceed BPT technology, do not displace BPT or override the EPA's authority to promulgate BPT for conventional pollutants.

As additional evidence that Congress enacted BCT to supplement, rather than to replace, BPT, the EPA points to the fact that, ten years after the enactment of BCT, Congress enacted a "stricter BPT" provision "requiring a level of control substantially greater or based on fundamentally different control technology" for BPT regulations promulgated after 1981.[101] This applies to all BPT regulations for all pollutants, including conventional pollutants, without limitation.

As evidenced by numerous rulemakings, the EPA has consistently interpreted the Act to allow the promulgation of BPT limitations applicable to facilities operating under NPDES permits despite the enactment of BCT standards in 1977. We must accord "considerable weight" to an agency's construction of a statutory scheme it is entrusted to administer.[102] Finding the EPA's interpretation of the Act to be reasonable, we conclude that CMA's objections do not compel us to remand the limitations.

3. The Cost of BPT

Finally, having concluded that the EPA construed the statute reasonably in declining to subject the BPT limitations to the BCT cost test, we find that the Administrator did not act arbitrarily and capriciously in determining that the costs of the limitations were justified by the significant amount of pollutants that would be removed.

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[101] Section 301(e) of the Water Quality Act of 1987, 33 U.S.C. § 1311(b)(3)(A).

[102] *Chevron USA, Inc. v. NRDC*, 467 U.S. at 844, 104 S.Ct. at 2782; *Train v. NRDC*, 421 U.S. 60, 75, 87, 95 S.Ct. 1470, 145, 43 L.Ed.2d 731; *E.I. du Pont De Nemours & Co. v. Train*, 430 U.S. at 134-35, 97 S.Ct. at 978.

Although the cost per pound of 71 cents required to meet the BPT limitations is almost double the 38 cents per pound that the OCPSF industry presently spends to remove conventional pollutants, the 71-cents-per-pound figure is not so high as to make the EPA's decision arbitrary and capricious:[103] "The selection of the point of diminishing returns is a matter for agency determination."[104]

B. The EPA's Definition of the BPT Data Base

NRDC challenges the EPA's BPT limitations on BODS and TSS as being too lenient. Specifically, NRDC argues that the BPT limitations are not based on the average of the best dischargers, and that the EPA improperly rejected sequential treatment options. These two arguments will now be more fully examined.

1. The EPA's Determination of the "Average of the Best" Dischargers

The EPA is required to promulgate BPT regulations based on the "average of the best" performers in the industry.[105] We accord some deference to the EPA's interpretation of its controlling statute; therefore, if the statute

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[103] The costs of BPT regulations for other industries have substantially exceeded 71 cents per pound: plastics molding and forming, cleaning water subcategory—$9.48 (49 Fed.Reg. 49,036 (December 17, 1984)); plastics molding and forming, finishing water subcategory—$12.72 (*id.*); dairy products, receiving stations (small)—$9.66 (administrative record for 1986 BCT rule); fruits and vegetables, cherry and cranberry subcategory (small and large)—$3.34 and $1.60 (*id.*). *See also Weyerhaeuser Co. v. Costle*, 590 F.2d at 1048 n. 56 (65 cents per pound—which, the EPA notes, is equal to $1.16 in 1986 dollars—would not constitute a wholly disproportionate cost).

[104] *American Petroleum Inst. v. EPA*, 540 F.2d at 1038.

[105] 1972 Leg.Hist. at 169 (statement of Sen. Muskie) and 1468 (Senate Report).

is capable of more than one reasonable interpretation, we must accept the EPA's interpretation, if reasonable.[106]

NRDC claims that the EPA used data from 71 of 99 plants, approximately 72%, as representing the group of "best dischargers" for purposes of promulgating BPT regulations. How can the group of "best" dischargers encompass 72% of the industry, queries NRDC, leading it to argue that the EPA should have further tightened its editing criteria, which would have led to more stringent regulations.

NRDC's argument is misleading, however. Out of 304 direct dischargers in the industry that will be subject to regulation, the EPA chose a particular technology, namely biological treatment with secondary clarification, which is used by 99 plants. Out of these 99 plants, the EPA then chose data from 71 plants to determine the "average of the best" for the purpose of promulgating its BODS regulations. The EPA defends its decision by noting that its *initial* edit reduced the field from 304 to 99. Thus, the NRDC's complaint that the EPA used 71 of 99 plants is mistaken because the edit in question was the second edit, 205 dischargers having already been weeded out.

We hold, therefore, that the EPA's class of performers for determining the "average of the best" was not unreasonably broad.

Another question is whether the CWA requires the EPA to consider the average of the best performers within an *industrial category*, or the average of the best performers that use a particular chosen technology within an industry. We hold that it is appropriate to extract a group of "best" performers from an industry category; this was done in this case when the EPA selected 99 out of 304 plants in its initial edit. In fact, the EPA went further by narrowing

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[106] *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. at 83, 101 S.Ct. at 306; *Chevron, USA, Inc. v. NRDC*, 467 U.S. at 844, 104 S.Ct. 2782.

the 99 plants down to 71. The EPA was not required to take the average of the best 99 plants using a particular technology, but merely to take the average of the best 304 plants in the industrial category. The legislative history of the 1972 amendments to the CWA specifies that "[t]he administrator should establish the range of 'best practicable' levels based upon the average of the best performance by plants of various sizes, ages, and unit processes within each industrial category."[107] Therefore, we find that the EPA's methods for setting the BPT standards for BODS were in compliance with the CWA.

Lastly, NRDC argues that the EPA's editing criteria for its representative "best performers," which were 95% biological oxygen demand (BOD) removal and 40 mg/l concentration, are actually below the industry's median. In support of this contention NRDC quotes from the preamble to the final rule, which it interprets as saying that the industry median is 95.8% removal and 29 mg/l concentration. Again, NRDC mischaracterizes the statistics. The median 95.8% removal and 29 mg/l concentration statistics apply to the 99 plants using biological treatment methods, not the 304 plants comprising the industry.[108]

2. The EPA's Rejection of Sequential Treatment Options

NRDC argues that the EPA, in choosing biological treatment plus clarification (Option I) for BPT, improperly re-

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[107] 1972 Leg.Hist. at 169 (Statement of Sen. Muskie); *see also EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. at 76 n. 15, 101 S.Ct. at 303 n. 15.

[108] There are data from a total of 99 direct discharging plants with end-of-pipe biological treatment only (the selected BPT technology, as discussed below) that reported average effluent BOD and a full range of information regarding production at the plant. All these data were used in the evaluation of the BODS data-selection criterion, even in cases of plants that did not report influent values and for which removal efficiencies could therefore not be estimated. The medical BODS effluent concentration for these 99 plants is 29 mg/l.

jected other sequential options. Specifically, these options were polishing ponds (Option II) and multimedia filtration (Option III), either of which can be sequentially added to a system already utilizing biological treatment plus clarification.[109] NRDC makes specific arguments with regard to both technologies; these arguments will next be further explored.

NRDC objects on several grounds to the EPA's failure to base BPT on Option II technology, which is biological treatment with clarification followed by polishing ponds. First, NRDC argues that the EPA's conclusion that polishing ponds are not currently used by a representative portion of the industry is incorrect. In support of this, NRDC points out that 64 plants in the industry use polishing ponds, and, of those, 17 meet the EPA's final editing criteria.[110] The EPA defends its conclusion by initially noting that the OCPSF industry is diverse and as a result plants have significantly different wastestream characteristics. Since only 17 plants out of 64 which had installed polishing ponds were able to meet the BPT editing criteria, the EPA in its judgment concluded that polishing ponds are not a sufficiently effective technology upon which to base the BPT limits. Moreover, the question is not merely whether the fact that 17 out of 64 plants using polishing ponds were able to meet the BPT editing criteria proves

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[109] BPT Option I consists of biological treatment, which usually involves either activated sludge or aerated lagoons, followed by clarification (and preceded by appropriate process controls and in-plant treatment to ensure that the biological system may be operated optimally). Many of the direct-discharge facilities have installed this level of treatment. BPT Option II is based on Option I with the addition of a polishing pond which follows biological treatment. BPT Option III is based on multimedia filtration as an alternative basis (in lieu of BPT Option II polishing ponds) for additional total suspended solids control after biological treatment. Dev. Doc. at VII-2 *reprinted in* Joint App. at 3702; *see also* 52 Fed.Reg. at 42,533.

[110] 52 Fed.Reg. at 42,537.

that polishing ponds are effective, but also whether the experiences of these 17 plants can be applied to the 304 plants subject to regulation. The EPA concluded that this was not possible due to the diverse nature of the industry.[111] The EPA also balanced the questionable feasibility of using polishing ponds against the cost of acquiring the large amounts of land needed for them and concluded that feasibility had not been sufficiently demonstrated to serve as a basis for BPT limitations.[112] We find the EPA's judgment in this regard to be rational and well supported by the record.

NRDC next argues that the EPA's position that the majority of plants using polishing ponds do not meet the BPT criteria shows that the industry is inadequate as a whole. The NRDC quotes from the preamble to the final rule where the EPA noted that "plants using polishing ponds in the OCPSF industry have done so not to add another treatment step after effective Option I level biological treatment but rather to improve upon substandard biological treatment."[113] The EPA responds that this quote is taken out of context. Again noting the diverse nature of the industry to be regulated, the EPA stresses that the plants did not use ponds to remedy inadequate performance which can be attributed to the model technology, but rather because these particular plants had unique and complex wastestreams which required additional treatment.

NRDC further alleges that the EPA's analysis of the data for Option II plants is flawed because the EPA compared the performance of Option II plants to all plants in the industry, which includes plants using Options I, II, and III. Thus, the EPA essentially compared plants using Option II against a class which also contained Option II plants;

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[111] *Id.*

[112] *Id.*

[113] *Id.*; *see also* Dev.Doc. IX-3-IX-4, *reprinted in* Joint App. 4236-37.

this tended to improve the performance of the latter class, masking the true benefits of ponds. NRDC contends that the EPA should have compared Option II plants to all other plants which do not use Option II. The EPA admits that NRDC's suggested approach is the better one, but notes that it corrected its error in the preamble to the final rule by comparing Option II plants to Option I plants.[114] The EPA corrected this error in promulgating the final rule, and the corrected data support the EPA's conclusion.

NRDC claims, in similar fashion to its above argument regarding polishing ponds, that the EPA improperly rejected Option III as a BPT sequential treatment option. NRDC claims that multimedia filtration results in significant improvements in TSS removal, but the EPA cites data which indicate that NRDC's claim is unfounded.[115] Specifically, the EPA rejected filtration as unproven because, of the 11 of the 28 plants with filtration that satisfied the EPA's editing criteria, all 11 had other processes in addition to filters, and there was no evidence that the plants would not have satisfied the BPT criteria even without filters.[116] Due to the diversity of the OCPSF industry,

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[114] In examining the data from the 18 plants originally placed in the Option II data base (using the 95/50 criteria), EPA noted that they yielded concentrations that were not much lower that Option I concentrations. Option II plants averaged only 2 mg/l BODS and 8 mg/l TSS lower than Option I plants. Because these increments seemed rather small, EPA performed a statistical analysis to compare the averages for the two data bases. The results of the analysis did not provide evidence of a significant difference between the two data sets. 52 Fed.Reg. 42,537.

[115] *See* Dev.Doc. Table VII-53, *reprinted in* Joint App. 3753.

[116] EPA discussed this issue in more depth in the Development Document:

> Eleven plants in the BPT data base use BPT Option III technology and meet the final editing criteria. Thus, this option would require EPA to regulate all seven subcategories based upon a very small

the EPA determined that the data from 11 plants did not demonstrate the effectiveness of filters throughout the industry, and we defer to the EPA's determination.

C. The "Summer/Winter Issue": The EPA's Decision Not to Subcategorize Based on Climatic Differences

Petitioners Goodyear, DuPont, M & T, Monsanto, and Union Carbide (hereinafter collectively "Goodyear") challenge the BPT limitations for failure to account for cold-temperature effects. Goodyear argues that because cold temperatures adversely affect biological treatment, the EPA should have created a separate class for cold-temperature plants, conducted a technical assessment and cost analysis for this class, and calculated the incremental cost-effectiveness of bringing this class into compliance.

The EPA used biological treatment with secondary clarification as the model technology for formulating the BPT limitations.[117] Biological treatment involves treating was-

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data set. As shown in Table Vii-36, the median effluent TSS concentration value for these plants is 32 mg/l. Even if three additional plants are included in this data base because they use Option I treatment plus either ponds of activated carbon followed by filters, the resulting median TSS value is 34 mg/l. These results, when compared to the performance of clarification only following biological treatment (median value of 30 mg/l), clearly show that the efficiency of filtration following good biological treatment and clarification is not demonstrated for this industry. Moreover, on the average, OCPSF plants with more than Option I treatment in EPA's data base (biological treatment plus filtration) have not demonstrated significant BODS removal beyond that achievable by Option I treatment alone. The median BODS concentration value for these plants is 19 mg/l compared to a median value of 23 mg/l BODS for the plants with Option I technology in place which meet the 95 percent/40 mg/l BODS editing criteria. Therefore, EPA does not believe that the data support any firm estimate for incremental pollutant removal benefits and incremental costs for BPT Option III.

Dev.Doc. VII-2, *reprinted in* Joint App. 3808-10.

[117] 52 Fed.Reg. 42,534.

tewater with microorganisms that biodegrade and sometimes absorb the organic pollutants. Goodyear contends that the microorganisms used in biological treatment are adversely affected by cold temperatures, thus affecting the efficacy of biological treatment. Therefore, Goodyear argues, many plants in the northern and middle latitudes will not be able to comply with the BPT limitations even if they employ the model technology. Goodyear argues that these cold-temperature plants should be grouped into a separate subcategory and subjected to less stringent BPT limitations.

The EPA decided not to provide separate summer/winter limitations or to subcategorize the OCPSF industry based on temperature. This decision is clearly supported by the record. The EPA determined that the best plants in the industry could comply with the BPT limitations throughout the year. The EPA also conducted a detailed analysis which demonstrated that the plants operating in the coldest temperatures and with the greatest seasonal temperature fluctuations dealt with these problems more effectively than southern plants, indicating that attention to appropriate design and operation features overcomes any temperature-related difficulties in treatment. The EPA concluded that cold temperatures had, at most, an insignificant effect upon the treatment of wastewater at plants that took appropriate measures. Finally, the EPA also considered the incremental costs of ensuring effective treatment during the winter and increased its cost estimates to reflect such treatment using a temperature-correction factor.

1. Diversity of the Data Base

The BPT regulations for the OCPSF industry are based upon a broad and geographically diverse population of plants. The EPA used data from 71 plants to establish the long-term averages, and data from 21 plants to establish the variability factors. Together, these data formed the

basis for the BPT limitations.[118] The northern, southern, and middle latitude regions are all well represented in both sets of data.[119] Furthermore, the data from these plants were collected throughout the year and thus represent a level of treatment performance that may be obtained under all seasonal conditions.[120] Additionally, this large data base represents a wide range of production operations. The size and diversity of the data base ensures that the BPT limitations based upon this data can generally be achieved across the industry, regardless of climate.[121] This basis alone is sufficient to support the limitations.[122]

Petitioners object to the EPA's exclusion of seven plants that had permits allowing compliance with less stringent limitations during the winter months from the set of 21

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[118] 52 Fed.Reg. 42,533-35.

[119] The set of 21 plants contains 6 northern plants, 4 mid-latitude plants, and 11 southern plants. Twenty of these plants are identified by geographical regions. Dev.Doc. VII-94-96, *reprinted in* Joint App. at 3794-96. The remaining plant is in Puerto Rico. Dev.Doc. VII-90, *reprinted in* Joint App. at 3790. The larger data set of 71 plants contains considerably more plants from each of the three regions.

[120] Dev.Doc. at VII-91-92, *reprinted in* Joint App. at 3791-92.

[121] 52 Fed.Reg. at 42,556.

[122] *Marathon Oil Co. v. EPA*, 564 F.2d at 1269, n. 46 (EPA's conclusion that limitations could be met throughout the year upheld based on the fact that some of the data from one plant used to develop limitations were collected during the late winter and early spring); *American Paper Inst. v. EPA*, 540 F.2d at 1306 (limitations based upon ten geographically diverse plants, including variability factors derived from a few plants "located in cold climates," upheld); *American Meat Inst. v. EPA*, 526 F.2d at 454-56 (compliance by several plants during winter months demonstrated the achievement of the limitations on a year-round basis). *See also Kennecott v. EPA*, 780 F.2d 445, 450 (4th Cir.1985), *cert. denied*, 479 U.S. 814, 107 S.Ct. 67, 93 L.Ed.2d 25 (1986) (limitations upheld based upon statistical extension of data which allegedly did not reflect "seasonal changes in temperature and precipitation, production surges or slowdowns"); *Weyerhaeuser Co. v. Costle*, 590 F.2d at 1054-55.

plants used to develop the variability factors. The EPA fully explained its decision to exclude these plants:

> [B]ecause these plants were subject to meeting two different sets of permit limits, they had no incentive to attempt to achieve uniform limitations throughout the year. Not surprisingly, then, the daily data from these plants exhibit a two-tier pattern. These data can be characterized by two means, and the variability of these data over a 12 month period is fundamentally different from the data from plants required to meet only one set of permit limits. Consequently, the data generated during these periods is not representative of well-operated biological treatment, which as noted above is capable of uniform treatment throughout the year as demonstrated by a number of plants.[123]

These plants were in fact included in the 71-plant data base used to develop long-term averages. They were excluded only from the variability analysis.[124] Therefore, their lower average performance during the winter is reflected in the BPT limitations. It is reasonable for the EPA to choose not to rely on plants that have no regulatory incentive to achieve uniform performance, particularly where an ample data base of plants meeting uniform year-round permit limitations was available.[125] The exclusion of the data from the seven plants operating under special permits was adequately explained and is a determination "peculiarly within EPA's expertise." The decision is therefore

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[123] 52 Fed.Reg. at 42,556.

[124] Dev.Doc. at IV-a-55-62, *reprinted in* Joint App. at 4396-4403.

[125] *See Sierra Club v. Costle*, 657 f.2d 298, 362 (D.C.Cir.1981) (in establishing new source performance standards in the Clean Air Act, EPA correctly did not rely on data from existing plants that have not been designed to operate at the efficiency level required by the new source standards).

entitled to judicial deference.[126] Moreover, the EPA did not selectively exclude from the variability data base those plants that performed worse in the winter than in the summer.[127] Thus, any difference between winter and summer variability at the best plants was incorporated into the variability factors used to develop the limitations. There is ample support in the record for the EPA's conclusion that lower removal efficiencies were the result primarily of factors other than cold temperature and that the BPT limitations are achievable in all climates on a year-round basis.[128] Goodyear's contentions to the contrary are therefore without merit.

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[126] *American Meat Inst. v. EPA*, 526 F.2d at 457; *accord Kennecott v. EPA*, 780 F.2d at 450.

[127] Dev.Doc. at VII-79-104, *reprinted in* Joint App. at 3779-3804.

[128] The EPA conducted a series of analyses that confirmed that the limitations are achievable in all climates on a year-round basis. Dev.Doc. at VII-79-104, *reprinted in* Joint App. at 3779-3804. EPA evaluated data from 20 or the 21 plants that had reported daily data (i.e., the results of daily effluent monitoring) and were used in the BPT variability analysis. Dev.Doc. at VII-82, *reprinted in* Joint App. at 3782. EPA noted that there was a slight reduction in BODS removal efficiency and a corresponding small increase in effluent concentration at some plants, while other plants' performance actually improved during the winter, and others had no substantial change. Dev.Doc. at VII-83, *reprinted in* Joint App. at 3783. Therefore, no correlation was shown between temperature and treatment performance. *Cf. American Meat Inst. v. EPA*, 526 F.2d at 455 (upholding year-round limits for data which did not show a direct correlation between removal efficiency and cold weather).

The EPA also performed regional analyses to examine the winter performance of plants within certain latitudes and to compare the overall performance of groups of plants from different latitudes. The EPA determined that plants in the northern region had the highest annual removal efficiency, 98%. Dev.Doc. at VII-83, *reprinted in* Joint App. at 3783. The EPA reasonably concluded that this analysis showed that removal efficiency was affected primarily by factors unrelated to climate. Dev.Doc. at VII-88, *reprinted in* Joint App. at 3788. The EPA also noted that the data indicated only minimal treatment-efficiency

2. Winter Removal Efficiencies

Goodyear also argues that the EPA was required to establish a separate subcategory for plants that could not achieve the BPT limitations due to cold-temperature effects. As we held above, however, the record supports the

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variations during the spring and autumn months when temperature fluctuations are the greatest, casting doubt on the theory that temperature fluctuations would impede treatment. Dev. Doc. at VII-90, *reprinted in* Joint App. at 3790.

The EPA performed a similar analysis on a different set of plants that had reported only average data over the course of three-month periods and the results were consistent with those obtained in the preceding analysis. Dev.Doc. at VII-88-89, *reprinted in* Joint App. at 3788-89. The southern plants experienced an average 5% loss in treatment efficiencies during the winter, and the northern plants had little loss in efficiency. *Id.* The EPA concluded that "while northern and middle latitude plants would have larger swings of temperature going from season to season, these swings have been compensated for through operation and process modifications." *Id.* The larger difference between summer and winter removal efficiencies for southern plants indicated that "these facilities have not adequately addressed the smaller temperature swings by operational and process modifications." *Id.* A fourth analysis demonstrated that temperature defined in terms of "degree days" (the measure of temperature typically used by power companies to estimate heating bills) was not a significant factor with respect to the BOD and TSS effluent concentrations for particular BPT subcategories. Dev.Doc. VII-90, *reprinted in* Joint App. at 3790. A fifth analysis examined plants' effluent concentration based upon consideration of months rather than "degree days" and reached the same conclusion. Dev.Doc. at VII- 93, *reprinted in* Joint App. at 3793.

All of the above analyses support the EPA's conclusion that cold temperatures had, at most, an insignificant effect upon wastewater treatability at plants that took appropriate measures to deal with potential temperature effects. Therefore, the EPA rationally determined that plants with lower efficiencies are affected as much by inefficient operating practices as by winter temperature considerations or by fluctuating temperatures. 52 Fed.Reg. at 42,556. Together with the fact that the limitations are based on year-round industry data from a large and geographically-diverse set of plants, the EPA's analyses support its determination that the BPT limitations are achievable throughout the year.

EPA's conclusion that cold temperatures alone did not have a significant effect on plants' abilities to meet the BPT limitations. Thus, the EPA could reasonably conclude that the effects of temperature on treatment effectiveness did not provide a basis for subcategorization. Goodyear contends that the EPA did not have sufficient data indicating that technology was available to overcome the effects of temperature. The EPA, however, did identify numerous practices that were used successfully by OCPSF plants to improve their winter performance.[129] The EPA is not required to analyze all possible causes of each plant's non-compliance with BPT and to recommend design and operating practices for each plant.[130] The EPA concluded reasonably that the limitations could be met during all seasons and identified several means of doing so.

Finally, Goodyear argues that the EPA failed to consider whether the technology required to overcome the effects of temperature is cost-effective. The EPA is required by statute to consider costs in relation to benefits only for categories or subcategories of plants, not for in-

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[129] Dev.Doc. at VII-100-104, *reprinted in* Joint App. at 3800-04. The EPA listed the following wintertime practices which, if properly applied, compensated for any cold temperature variation: reduce excessive storage time prior to treatment; insulate treatment units; cover open tanks; maintain higher concentrations of mixed liquor suspended solids; and reduce the food-to-microorganism ratio. Insulation included installing tanks in the ground rather than above ground, using soil to cover the walls of above-ground units, and enclosing treatment units. Dev.Doc. at VII-1030104, *reprinted in* Joint App. at 3803-04. The EPA also provided two case histories of plants which had used these and other techniques to address the effects of temperature on treatment. Dev.Doc. at VII-101, *reprinted in* Joint App. at 3801.

[130] *See E.I. du Pont de Nemours & Co. v. Train*, 430 U.S. at 128-29, 97 S.Ct. at 975; *American Meat Inst. v. EPA*, 526 F.2d at 451 ("practicability" and "availability" of technology are not to be determined on a plant-by-plant basis).

dividual plants.[131] As we held above, the EPA was not required to create a subcategory consisting of plants that had difficulty complying with the limitations due to temperature effects. There is no record basis for isolating the effect of temperature on treatment effectiveness from the effects of other, more significant factors.[132] Consequently, as the EPA notes correctly, there is no class of plants for which temperature-related costs can be estimated and assessed against pollutant reduction benefits.

We hold, therefore, that the Administrator concluded rationally that the BPT limitations are practicable for all plants in all seasons.

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[131] *E.I. du Pont de Nemours & Co. v. Train*, 430 U.S. at 128-30, 97 S.Ct. at 975-76; *BASF Wyandotte Corp. v. Costle*, 598 F.2d at 662; *American Iron & Steel Inst. v. EPA*, 526 F.2d at 1051; *FMC Corp v. Train*, 539 F.2d at 979 (the estimation of BPT costs should not serve as a dilatory device, obstructing the Agency from proceeding with its primary mission of cleaning up the lakes, rivers, and streams of this nation).

[132] However, the EPA did consider the general effect temperature may have on treatment costs across the industry. First, the EPA used each state's cold-season temperatures to adjust downward the biodegradation rate used in estimating costs for full-scale and second-stage biological systems in that state. Dev.Doc. at VII-104, *reprinted in* Joint App. at 3804. This approach had the effect of assuming slower biodegradation rates due to cold weather and designing the entire system to meet worst-case conditions. Second, the EPA developed Temperature Correction Factors for costing the upgrading of existing treatment facilities, based upon each state's winter temperatures. Dev.Doc. at VII-104 and VIII-26-32, *reprinted in* Joint App. at 3804 and 3979-85. These factors were multiplied by the normal, warm-weather treatment costs to obtain increased costs of treatment. In essence, the EPA's costing methodology increased costs for treating discharges throughout the year to ensure adequate costing for cold weather. The EPA"s technical analyses of temperature effects and its reliance on a data base reflecting geographical and seasonal diversity, coupled with a detailed cost analysis that explicitly increased cost estimates to account for potential cold-weather effects, all combined to provide a rational basis for the Administrator's conclusion that the limitations are practicable.

D. BPT Subcategorization and the EPA's Use of Standard Industrial Classification (SIC) Codes

CMA and NRDC both argue that the EPA's classification scheme in development of BPT limits for the OCPSF industry was improper because it was based in part upon Standard Industrial Classification (SIC) codes. There are two strands to this argument. CMA argues that there is no significant correlation between SIC codes and effluent levels, thus rendering the SIC-code-based classification scheme arbitrary. NRDC takes a different tack, arguing that EPA did not provide for sufficient public notice and comment regarding the proposed system. Based on the analysis below, we reject both arguments and uphold the EPA's SIC-code-derived classification.

1. CMA's Challenge to the BPT Subcategorization

CMA challenges the EPA's division of the OCPSF Industry into seven subcategories for the purpose of establishing BPT limitations on the ground that the subcategories are based on SIC-product groupings rather than wastewater characteristics or treatability. CMA argues that the EPA has created an inequity by grouping together plants with substantially different influent concentrations and subjecting them to the same concentration limitations, thereby requiring, in effect, a higher percent removal at plants with higher influent concentrations.

In Section 304(b)(1)(B), Congress listed several factors, in addition to cost, that the EPA shall "take into account" in determining BPT, including the age of equipment, the process employed, engineering aspects of treatment, process changes, and non-water-quality environmental impacts.[133] Based on these factors, the EPA determines whether plants within an industry should be assigned to

[133] 33 U.S.C. § 1314(b)(1)(B).

a subcategory subject to more particularized regulations than the industry as a whole.

However, the EPA is required to create a separate subcategory for a group of plants only when they are so fundamentally different from other plants on which the limitations are based that they cannot practicably achieve the effluent limitations achieved by the average of the best plants in the industry.[134] The EPA has considerable discretion in evaluating these factors; it is enough that the EPA considered the relevant factors and reached a rational conclusion about them.[135] The Agency's task is "to establish numerical standards limiting effluent pollution," and it should concentrate "on grouping plants that could meet the same limitations."[136] If plants can meet the same limitation, they need not be subcategorized simply because they are different.[137]

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[134] *See Chemical Mfrs. Ass'n v. NRDC*, 470 U.S. at 119-22, 129-34, 105 S.Ct. at 1104-06, 1109-12 (the Supreme Court recognized that the substantive test for subcategorizing an industry is the same as that which applies to establishing fundamentally-different-factor ("FDF") variances—whether limitations based upon a range of plants may be fairly extended to another plant or class of plants that is alleged to be fundamentally different with respect to relevant statutory factors); *EPA v. Crushed Stone Ass'n*, 449 U.S. at 78, 101 S.Ct. at 304 (a BPT limitation is "incomplete" only if it was determined without consideration of a "current practice fundamentally different from those that were considered by the Administrator").

[135] *Reynolds Metals Co. v. EPA*, 760 F.2d at 564; *Wyandotte Corp. v. Costle*, 598 F.2d at 656; *Weyerhaeuser Co. v. Costle*, 590 F.2d at 1047.

[136] *Reynolds Metals Co. v. EPA*, 760 F.2d at 565.

[137] *See Chemical Mfrs. Ass'n v. NRDC*, 470 U.S. at 120, 105 S.Ct. at 1105 (subcategories are necessarily rough-hewn); *Kennecott Copper Corp. v. EPA*, 612 F.2d at 1241 (rough basis for subcategorization suffices); *Wyandotte Corp. v. Costle*, 598 F.2d at 655 (plants within subcategories need not be identical and in fact may have production outputs that differ by a factor of fifty); *Kennecott v. EPA*, 780 F.2d at 451 (not all variation and pollution loads must be accounted for); *American Iron &*

The subcategories for the OSPSF industry are defined by generic types of OCPSF production. The EPA maintains that since a plant's chemical processes are closely related to the type of production in which it engages, the subcategorization bears a reasonable relationship to such chemical processes and the wastewater characteristics associated with those processes.[138]

In making its decision to subcategorize the OCPSF industry for the purpose of its BPT regulations, the EPA analyzed several potential subcategorization factors, such as age of plant, temperature, and SIC-code classification of the plant, just to name a few. CMA disputes whether SIC codes actually have a relationship with BODS effluent concentration. They present a statistical analysis purportedly showing that SIC codes have no significant correlation with BODS effluent. CMA analyzed several categorization schemes, including the one retained by the EPA, and determined the Value of R^2, the coefficient of determination,

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Steel Inst. v. EPA, 568 F.2d at 299-300 (not all subcategory differences must be accounted for).

[138] 48 Fed.Reg. at 11,832-34; Dev.Doc. IV-20-1, *reprinted in* Joint App. at 3519-20. EPA's 1985 Federal Register notice explained the relationship of the subcategories to the chemical processes, and thus to wastewater characteristics in the industry. 50 Fed.Reg. at 29,074. Plastics plants employ only a small subset of the chemistry used by organics plants to produce a limited number of products. Thus, organics and plastics plants represent two broad groupings within the industry. These two groups may be subdivided further. Among the plastics plants, those producing thermo-setting resins and thermo-plastic materials may be distinguished, while each of those producing rayon and synthetic fibers has unique wastewater characteristics. Organic chemicals producers were divided into three groups based upon volume of production, which also relates to fundamental process chemistry characteristics. First, the highest volume chemicals, commodity chemicals, also have the simplest chemical structures. The second groups, bulk chemicals, typically use commodity chemicals as raw materials to produce structurally more complex chemicals. The third group, specialty chemicals, are produced in smaller volumes and devoted to particular uses (e.g., dyes and pigments) and are even more structurally complex. *Id.*

for each.[139] CMA argues that the categorization scheme which was retained by the EPA has an R^2 of only 0.052, which is not significantly better than other rejected classification schemes. In fact, a random shuffling performed by CMA of BODS data with respect to SIC codes yielded an R^2 of 0.030 in the CMA analysis. This, argues CMA, supports its position that the classification scheme adopted by the EPA is arbitrary and capricious, since it is only slightly better than a random categorization scheme. CMA also criticizes the EPA's addition of allegedly irrelevant dummy variables to the EPA's R^2 analysis of its own model, the alleged effect of which was to artificially inflate the R^2 value.[140]

We are of the opinion that the R^2 analysis presented by CMA is inconclusive. Though an R^2 analysis can be informative, it cannot of itself conclusively prove or disprove the adequacy of a particular categorization scheme. A good model may nonetheless have a small R^2 value if

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[139] R^2, the coefficient of determination, generally is a measure of the proportion of variation in data which is explained by the regressor variable. In this case, R^2 describes the extent to which BODS effluent levels are explained by the SIC code categories. The range of values for R^2 always falls between 0 and 1; values closer to 1 imply that most of the variability is explained by the regressor variable. *See* Montgomery & Peck, Introduction to Linear Regression Analysis 33 (Wiley & Sons, 1982).

[140] Although introducing additional variable into the calculation can increase R^2, CMA has not provided enough information for us to determine whether the R^2 model with dummy variables is better or worse than the base model. Montgomery & Peck note that:

> [a]lthough R^2 increases if we add a regressor variable to the model, this does not necessarily mean that the new model is superior to the old one. Unless the error sum of squares in the new model is reduced by an amount equal to the original error mean square, the new model will have a larger error mean square than the old one because of the loss of one degree of freedom for error. Thus the new model will actually be worse than the old one.

Montgomery & Peck at 34.

the spread of data points along the x-axis (horizontal axis) is small.[141] Thus, the fact that the R^2 value attributed to the SIC-code-based classification is relatively small (0.052) is an insufficient basis for us to conclude that the EPA's industrial classification is arbitrary and capricious. Moreover, the coefficient of determination, R^2, is merely a limited indicator of model adequacy. Ultimately, we believe the EPA's explanation that SIC codes tend to be organized around the products produced by various segments of the industry, and that the type of product in turn influences the wastestream characteristics of those plants, to be a sufficient rationale upon which to uphold the EPA's classification scheme.[142]

CMA further argues that analysis of its proposed subcategorization scheme based on influent BODS concentrations yields an R^2 of 0.42, which is higher than the R^2 value of the EPA's SIC-code-based plan (although not higher than the EPA analysis when the dummy variables are included). Therefore, argues CMA, the EPA should have subcategorized the OCPSF industry based on influent levels, as opposed to SIC codes. Again, we find this argument to be insufficient for the following reasons. First, it should be remembered that a large R^2 value does not

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[141] *Id.*

[142] The EPA found that these process characteristics relate in turn to fundamental wastewater characteristics in the OCPSF industry. For instance, plastic compounds can be removed more readily from the process stream of a plant than other products. Therefore, when a plant removes the plastic compounds it is producing from the wastestream, little polluting matter (other than organic compounds) remains to be discharged as waste. EPA concluded that this characteristic would allow a plastics manufacturer to achieve a lower biological oxygen demand (BOD) than an organics manufacturer. Dev.Doc. at IV-20, *reprinted in* Joint App. at 3519. As another example, among the three organic subcategories, larger volume chemicals tend to have a simpler molecular structure, and this generally results in a greater biodegradation rate and a lower effluent BOD. Dev.Doc. at IV-21, *reprinted in* Joint App. at 3520.

conclusively prove that the variables are causally related.[143] Second, CMA provides a graph of its data points showing influent levels (x-axis) versus effluent levels (y-axis). There are two remote points in x-space on this graph, both with large influent and effluent levels. Data plots with such remote points tend to have much higher R^2 values even though the model is not necessarily superior, since those points exert a greater influence on the slope of the regression line than the points which are clumped together nearer the origin.[144] Moreover, if these points are bad values (due to error), their deletion may reduce the resulting value of R^2. Although these points may just as well be valid measurements, this determination requires the exercise of discretion on the part of the analyst. It is unclear how CMA exercised its editing discretion in developing the model they presented, and in any event, the limited nature of CMA's regression analysis precludes us from mandating that EPA adopt CMA's model.

2. NRDC's Notice and Comment Challenge

NRDC argues that the EPA failed to provide notice of its intent to limit the applicability of the OCPSF regulations to certain SIC codes. NRDC complains that, as a result of this lack of notice, it was denied the opportunity to comment on this part of the regulation.

We find NRDC's argument to be lacking in merit. During the rulemaking, EPA invoked SIC codes to define

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[143] Montgomery & Peck at 36; *see also* G. Box, W. Hunter & J. Hunter, Statistics for Experimenters 487 (1978).

[144] The mathematical reason for this is that the value for R^2 generally increases as the spread of the points along the x-axis becomes greater. Outlier points tend to have a large effect on the spread along the x-axis. Montgomery & Peck at 34

which facilities would be covered by the final rule.[145] Our review of the record persuades us that NRDC was fairly apprised of the issues at stake, and that the EPA's decision to limit the rules to the five SIC codes identified in its original notice was a logical outgrowth of the rulemaking proceeding.

E. Issues Concerning Waste-Stabilization Ponds

Petitioners DuPont, Texas Eastman, Union Carbide, and Air Products incorporate the use of waste stablilization ponds ("WSP systems") for the treatment of industrial wastewater. WSP systems consist of tanks where organic matter in wastewater is broken down through bacterial action. During the treatment process, algae form which increase the TSS in the effluent. Petitioners raise several claims regarding the application of the BPT limits to plants employing WSP systems. First, petitioners contend that the EPA acted arbitrarily and capriciously in determining that pond algae are a conventional pollutant subject to the BPT limitations for BODS[146] and TSS.[147] Second, petitioners contend that the EPA violated the Act by failing adequately to account for algae-related problems in setting

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[145] In the preamble to EPA's initial proposal of the OCPSF regulations, EPA noted that approximately 1,200 facilities manufacture their principal products under "the OCPSF SIC Groups." 48 Fed.Reg. 11,828, 11,830 (1983). The only SIC groups listed were the same five upon which the final rule was based. In its next "Notice of Availability and Request for Comments" the Agency stated that it "has defined the Organic Chemicals Manufacturing industries to include all facilities within specific SIC codes." 50 Fed.Reg. 29,068, 29,091 (1985). In the same notice, EPA also presented several products lists to provide "guidance" in defining "BPT subcategories." *Id.* at 20,092. EPA intended to use the lists in defining subcategories within the industry. *Id.*

[146] BODS adversely affect the receiving waters because they deplete the oxygen available to fish, plant life, and other aquatic species.

[147] Suspended solids adversely affect receiving waters because they increase turbidity, reduce light penetration (impairing photosynthesis), and may settle to form sludgebanks.

BPT limits for BODS and TSS. Third, petitioners argue that the EPA acted arbitrarily and capriciously in specifying copper sulfate treatment as a means of controlling algae without adequate notice and comment on the practicality of that treatment technology.

We find that the EPA's implicit regulation of algae as a component of BODS and TSS had a rational basis and that the EPA was not required to create a separate subcategory for plants utilizing WSP systems. These four plants perform the same types of operations as other OCPSF plants and generate the same types of OCPSF process wastewaters and are thus properly subject to the same BPT limitations. Finally, we conclude that the EPA did not act arbitrarily and capriciously in designating copper sulfate treatment as a means of controlling algae.

1. EPA's Determination That Pond Algae Were Conventional Pollutants and Thus Subject to BPT Regulations

Petitioners argue that the EPA should not have included algae as a component of BODS and TSS because algae to not contribute to the environmental problems associated with BODS and TSS. We find, however, that the EPA's regulation of algae as a component of BODS and TSS had a rational basis.

The EPA notes correctly that Congress, without limiting the definition of the terms, includes BODS and TSS in the broad definition of conventional pollutants.[148] The EPA

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[148] Section 304(a)(4) requires EPA to publish "information identifying conventional pollutants, including but not limited to, pollutants classified as biological oxygen demanding, suspended solids, fecal coliform, and pH." 33 U.S.C. § 1314(a)(4). The Act prohibits the discharge of any "pollutant" except in accordance with a permit that implements BPT along with other requirements. 33 U.S.C. § 1311(a) and (b)(1)(B). "Pollutant" is defined as "solid waste, . . . sewage, . . . biological materials, . . . and industrial, municipal, and agricultural waste discharges into

concludes that because algae are both oxygen-demanding organisms and suspended solids, algae are encompassed within both BODS and TSS as those terms are used in the Act, and the EPA is thus authorized to include algae in the measurement of both TSS and BODS. The EPA also notes that Congress has specifically recognized that algae are a significant cause of water quality problems.[149]

In the OCPSF rulemaking, the EPA found that algae can indeed present significant water-quality problems:

> The control of algae growth in ponds, lakes, and reservoirs can be a serious problem in water quality management. Among the nuisances created by the often sudden blooming of one or more algal genera are: odors and tastes; fish kills; poisoned water fowl; shortened filter runs and water-purification plants; growths in pipes and other water conduits; and interference with industrial water uses. Therefore, proper control of algae growth in ponds is necessary to avoid the potential nuisances in the ponds and/or receiving waters.[150]

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water." 33 U.S.C. § 1362(6). Algae discharged from an industrial system may fit under several of these terms. Similarly, algae are encompassed within the term "Pollution," defined in the Clean Water Act as "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water." 33 U.S.C. § 1362(19).

[149] *See, e.g.*, 1972 Leg. Hist. at 1310 ("algae has [sic] grown so rapidly that sufficient oxygen is not available to support other forms of life").

[150] Dev. Doc. VIII-84, *reprinted in* Joint App. at 4037. *See also Mumford Cove Ass'n v. Town of Groton, Conn.*, 786 F.2d 530, 532 (2nd Cir.1986) (discharge from a sewage treatment plant resulted in "brackish water choked by a monoculture of algae excluding beneficial aquatic plant life"); *Stoddard v. Western Carolina Regional Sewer Auth.*, 784 f.2d 1200, 1204 (4th Cir.1986) (fish kill attributed to an algae bloom); *Montgomery Envtl. Coalition v. Costle*, 646 F.2d 568, 575 (D.C.Cir.1980) (excessive nutrients in the Potomac River degrade water quality both because the proliferation of algae is itself a nuisance and because algae respiration and subsequent death and decay use up oxygen dissolved

While petitioners take issue with some of the EPA's specific conclusions regarding the effects of algae on water quality, they have failed to demonstrate that the Administrator acted arbitrarily and capriciously in regulating algae as a conventional pollutant. The EPA has authority to regulate the discharge of a pollutant even where its effects are subject to some uncertainty.[151] We will not substitute our judgment for the Administrator's in this regard.

2. The EPA's Decision Not to Create a Subcategory for Plants Utilizing Waste Stabilization Ponds

Petitioners argue next that the EPA violated Section 304(b)(1)(B) of the Act by failing to adequately account for algae-related problems in setting BPT limits for BODS and TSS. As explained more fully above, Section 304(b)(1)(B) requires the EPA to "take into account" several factors, in addition to cost, in determining BPT, including the age of equipment and facilities, the process employed, the engineering aspects of the application of various types of control technologies, process changes, and non-water quality environmental impacts.[152] Petitioners assert that based on those considerations, the EPA should have created a separate subcategory for plants utilizing WSP systems, subject to less stringent BPT limitations on BODs and TSS than those applicable to the rest of the industry.

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in the river's waters, threatening other forms of aquatic life); *National Wildlife Fed'n v. Gorsuch*, 530 F.Supp. 1291, 1298 (D.D.C.) (algae causes oxygen depletion), *rev'd on other grounds*, 693 F.2d 156 (D.C.Cir.1982).

[151] *FMC Corp. v. Train*, 539 F.2d at 982-83; *C & H Sugar Co. v.EPA*, 553 F.2d 280, 289 (2nd Cir.1977); 1972 Leg.Hist. at 378 (BPT, as a technological standard will be required "even if the quality of the receiving waters does not require the imposition" of BPT). *See also* 1972 Leg.Hist. at 1305-06 (same).

[152] 33 U.S.C. § 1314(b)(1)(B).

Petitioners first claim that the EPA failed to consider the extent to which high effluent TSS concentrations are a function of the type of wastewater in the treatment system. The EPA maintains, however, that petitioners' plants do not differ materially from other OCPSF plants with respect to manufacturing operations or wastewater characteristics. Rather, the EPA argues, their plants differ only with respect to the type of treatment petitioners voluntarily chose to employ. Petitioners did not choose to employ the type of biological treatment system that is most commonly used by good performers in the OCPSF industry and that was used by the EPA for cost-estimating purposes: activated sludge, followed by secondary clarification.[153] Instead, petitioners chose to employ WSP treatment systems which generate additional pollutants in the form of algae. The EPA asserts that it therefore reasonably required petitioners' plants to meet the limitations demonstrated to be achievable by the average of the 71 "best" plants in the OCPSF industry,[154] rather than providing less stringent limitations for these plants simply because they chose to employ less effective treatment technology.

The EPA asserts that, as required by the Act, it considered in detail "the engineering aspects of the applica-

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[153] Dev.Doc. at VII-64 and VIII-1-5, *reprinted in* Joint App. at 3764 and 3954-58.

[154] *See Weyerhaeuser Co. v. Costle*, 590 F.2d at 1062 (rejecting claim that certain "non-settleable solids" cannot be removed by BPT, because ten plants were already in compliance); *American Paper Inst. v. Train*, 543 F.2d at 345 (limitations based upon industry data upheld regardless of whether treatment technologies are specified); *American Petroleum Inst. v. EPA*, 540 F.2d 1023 (regulations upheld where twelve plants already complied); *American Meat Inst. v. EPA*, 526 F.2d at 456 (the ability of two plants to meet EPA limitations using EPA's model technology in the summer demonstrates that the BOD and TSS limitations are achievable, contrary to assertions that algae growth precludes compliance).

tion of various types of control techniques" and used this factor to identify the data base from which it derived the BPT limitations. Those limitations properly reflected the results achieved by more effective treatment systems than those employed by petitioners. Petitioners cannot now be excused from meeting the BPT limits on the grounds that their present method of treatment is less effective than the average of the best—in this case, because WSP systems create additional pollutants. Such a construction of Section 304(b)(1)(B) would defeat the very purpose of establishing BPT limits. The EPA is not required to base BPT upon a technology that is less effective than the best practicable technology demonstrated in the industry.[155] Rather, in establishing BPT, the EPA "must forbid the level of effluent produced by the most pollution-prone segment of the industry, that segment not measuring up to 'the average of the best existing performance.' "[156] We therefore hold that the EPA was entirely reasonable in declining to create a subcategory for plants employing WSP treatment systems.

3. The EPA's Consideration of the Cost of Compliance for Plants Utilizing Pond Technology

Petitioners argue next that the EPA's failure to consider waste treatability resulted in the designation of unworkable upgrades to achieve BPT. The EPA does not seriously dispute petitioners' claim that the algae growth associated with petitioners' present treatment systems may not be

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[155] *American Iron & Steel Inst. v. EPA*, 526 F.2d at 1061 (rejecting petitioner's claim that limitation was invalid because one model treatment technology allegedly increased pollutants in effluent and holding that limitations are valid so long as one of several available treatment technologies can achieve compliance).

[156] *EPA v. National Crushed Stone Ass'n*, 449 U.S. at 76, 101 S.Ct. at 303.

remedied by relatively simple and inexpensive upgrades. Rather, the EPA notes that it "is entitled to look at costs on an industry-wide basis as opposed to plant-by-plant," and may use industry averages to develop "rough estimates" to help the Agency determine whether the cost is "wholly out of proportion" to the benefit.[157]

The EPA concedes that petitioners may be required to install entirely new treatment units consisting of activated sludge and secondary clarification. However, the EPA notes that it estimated the costs of such steps for nearly half of the plants in the industry requiring treatment improvements to comply with BPT.[158] Thus, even if Texas Eastman, DuPont, and Air Products are required to install new activated-sludge systems in order to comply with BPT, the costs of these systems would be within the range generally estimated for the industry as a whole. We have already held that the costs of the BPT limits for the OCPSF industry are not "wholly out of proportion" to the benefits. Because petitioners' compliance problems are not attributable to their production process, raw wastewaters, or other relevant factors, but only to their treatment systems, their costs in constructing and operating a biological system complying with the regulations will not differ materially from those incurred by many other industry members.[159] We therefore agree with the EPA that even this

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[157] *Wyandotte Corp v. Costle*, 598 F.2d at 662. As the Third Circuit has stated, "[n]othing in the Clean Water Act requires that a cost benefit analysis be made industry by industry, or plant by plant, or treatment technique by treatment technique." *Ford Motor Co. v. EPA*, 718 F.2d 55, 59 (3rd Cir.1983); *accord American Iron & Steel Inst. v. EPA*, 526 F.2d at 1053. Similarly, Congress intended that economic impacts be determined only for classes of facilities, rather than on a plant-by-plant basis. 1972 Leg.Hist. at 255, 304.

[158] Dev. Doc. at VIII-B53-59, *reprinted in* Joint App. at 4585-91.

[159] To the extent that the petitioners argue that EPA undercosted these three plants and thus underestimated total industry BPT costs as well, we agree that any such error would not have a significant

worst-case scenario does not provide a basis for exempting petitioners from the BPT limits that apply to the rest of the industry.

4. Copper-Sulfate Treatment for Algae Control

Finally, petitioners contend that although the EPA proposed copper sulfate as a means of controlling algae at a reasonable cost, this method was not considered in the rulemaking and would in fact impair the efficiency of their ponds and possibly result in excess discharges of copper, thereby causing water-quality problems.

While petitioners do raise legitimate concerns regarding the practicability of employing copper-sulfate treatment as a means of complying with BPT, the EPA did not rely on copper-sulfate treatment alone in estimating petitioners' compliance costs.

The EPA's cost estimates for Union Carbide, Texas Eastman, and DuPont were based on far more substantial treatment than the application of copper sulfate. For Union Carbide, the EPA costed an entirely new activated sludge system, which generates no algae. For both Texas Eastman and DuPont, the EPA estimated the costs of installing an additional chemically-assisted clarifier to enhance solids removal, and, for Texas Eastman, the EPA also costed an upgrade to its biological unit to enhance BODS removal.[160]

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impact on EPA's conclusions concerning BPT costs. EPA reasons that at worst, under petitioners' reasoning, it should have costed new biological treatment systems for 107 rather than 104 plants. Thus, the total industry-wide costs would increase only slightly, and the industry-wide cost per pound of conventional pollutants removed would only increase marginally from the 71 cents figure.

[160] Dev. Doc. at VIII-B56-57, *reprinted in* Joint App. at 4590 and 4587.

Again, while the EPA concedes that the treatment methods costed for Texas Eastman and DuPont may not in fact enable their WSP treatment systems to achieve the BPT limits, the EPA reasonably concluded that there is no basis on which petitioners may be excluded from the BPT rules.

Petitioners also argue that the BPT limitations should be remanded because the cost of copper sulfate as an algae treatment was not specifically discussed in the EPA's proposals. However, the EPA notes that the control of algae by using copper sulfate was not the basis for BPT and was considered as part of a subsidiary analysis that specifically responded to petitioners' comments.[161]

Thus, to the extent that the costing of copper-sulfate treatment for algae played a role in the rulemaking proceeding, it was a "logical outgrowth" of the proceedings in general and of petitioners' own comments in particular.[162]

5. The Cost of the BPT Limitations

Petitioners argue that the cost of BPT, even apart from the issue of algae-control costs, is wholly disproportionate

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[161] The Ponds Committee had submitted detailed comments in 1983 and 1985 urging EPA to consider the special problems its members had experienced in treating algae. Joint App. at 410-34, 2079-318. More specifically, the Committee's 1985 comments included a review of various algae-treatment methods and specifically discussed the use of chemical doses in general and copper sulfate in particular to remove algae. *Id.* at 2090. The Committee attached an API analysis that stated that copper sulfate is one of the two chemicals commonly used for algae control and that it is an "effective poison for microscopic vegetation. . . ." *Id.* at 2281-83. The sole reservation expressed in the analysis was the potential for adverse effects on fish if discharged at a level that exceeds 140 ug/*l* or results in the depletion of dissolved oxygen caused by algae decay. *Id.* at 2283.

[162] *See Brazos Elect. Power Coop., Inc. v. Southwestern Power Admin.*, 819 F.2d 537, 542-43 (5th Cir.1987); *Taylor Diving & Salvage Co. v. Department of Labor*, 599 F.2d 622, 626 (5th Cir.1979).

to its benefits. We held above that the cost of BPT was *not* wholly disproportionate to its benefits and therefore need not further address petitioner's claims to the contrary.

F. "Plant Specific" Claims of Union-Carbide, Borg-Warner, DuPont, Monsanto, and Ethyl

Several petitioners, including Union Carbide, Borg-Warner, DuPont, Monsanto, and Ethyl, claim that the BPT limitations are arbitrary because the EPA failed to account adequately for wastestream characteristics. Petitioners assert that the wastestream characteristics of certain of their plants preclude compliance with the OCPSF industry limitations. These claims are considered together because several of these petitioners raise highly individualized objections to the limitations.

We will address each petitioner's claim in turn. As an initial matter, however, we note that the EPA is not required to consider fundamentally different factors of particular plants in the national BPT rulemaking. Both Congress and the Supreme Court have expressed concern that the process of formulating nationally applicable water-quality standards would be unduly impeded by requiring EPA to address the idiosyncracies of individual plants in the context of a national rulemaking. The Supreme Court has held that the fundamentally-different-factors (FDF) variance procedure provides an entirely acceptable alternative to subcategorizing an industry to account for plant-specific characteristics.[163] Congress has codified the FDF procedures in the CWA, encouraging the EPA not to complicate and delay unduly the promulgation of national effluent-limitation guidelines and standards where the FDF procedure could be employed to address the concerns of individual facilities claiming to be unique.[164]

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[163] *Chemical Mfrs. Ass'n v. NRDC*, 470 U.S. at 116, 105 S.Ct. 1102, 84 L.Ed.2d 90.

[164] 33 U.S.C. § 1311(n).

The Supreme Court held in 1977 that the EPA may establish categorical BPT limitations, "so long as some allowance is made for variations in individual plants, as EPA has done by including a variance clause in its 1977 limitations."[165] Relying heavily on legislative history that demonstrated Congress' intent to replace the site-specific approach to water-quality regulation with technology-based limitations that apply uniformly to categories of dischargers,[166] the unanimous Court reasoned that the alternative view "would place an impossible burden on EPA" contrary to the legislative purpose of the Act.[167]

Addressing the EPA's identical FDF variance procedure for pretreatment standards, the Supreme Court has approved the procedure "as a mechanism for insuring that [EPA's] necessarily rough-hewn categories do not unfairly burden atypical plants."[168] The Court explained:

> EPA and CMA point out that the availability of FDF variances makes bearable the enormous burden faced by EPA in promulgating categories of sources and setting effluent limitations. Acting under stringent timetables, EPA must collect and analyze large amounts of technical information concerning complex industrial categories. Understandably, EPA may not be apprised of and will fail to consider unique factors applicable to atypical plants during the categorical rulemaking process, and it is thus important that EPA's nationally binding categorical pretreatment standards

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[165] *E.I.du Pont de Nemours & Co. v. Train*, 430 U.S. at 128, 97 S.Ct. at 975.

[166] *Id.* at 121, 126-27, 129-30, 97 S.Ct. at 971, 974; Leg.Hist. at 169, 1421-26, 1460.

[167] *DuPont*, 430 U.S. at 132-33, 97 S.Ct. at 977; Leg.Hist. at 170-72, 304, 1468.

[168] *Chemical Mfrs. Ass'n v. NRDC*, 470 U.S. at 120, 105 S.Ct. at 1105.

> for indirect dischargers be tempered with the flexibility that the FDF variance mechanism offers. . . .[169]

The Court stated that the FDF variance procedure was authorized by Congress in significant part to ensure that the national rule would not be overturned simply because of the Agency's failure to consider unique plants.[170] Several courts of appeal have subsequently relied upon the availability of an FDF variance procedure as the basis for rejecting challenges to BPT regulations that are based upon allegedly facility-specific factors.[171]

In codifying the FDF variance procedure in the CWA,[172] Congress specifically emphasized that the procedure serves as a "safety valve" to the categorical statutory scheme, allowing EPA to address plant-specific variations through a separate administrative process, outside of the national rulemaking. The House Report stated:

> There are two approaches for responding to a facility with valid grounds for arguing that it is fundamentally different from other facilities in its category. One possibility is to develop a separate subcategory within the regulation, undertake a separate data collection and analysis effort and then repropose and issue the final rule. The other alternative is to leave the national rule in place and use the FDF determination procedure to establish alternative technology-based

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[169] *Id.* at 132-33, 105 S.Ct. at 1111-12.

[170] *Id.* at 133 & n. 25, 105 S.Ct. at 1112 & n. 25. The Court cited numerous Supreme Court decisions upholding regulations in part because they provided for the granting of exceptions or variances. *Id.*

[171] *Kennecott Copper v. EPA*, 612 F.2d at 1244- 45; *BASF Wyandotte Corp. v. Costle*, 598 F.2d at 656; *Weyerhaeuser Co. v. Costle*, 590 F.2d at 1040-41, 1048 n. 56; *American Iron & Steel Inst. v. EPA*, 568 F.2d at 305; *American Iron & Steel Inst. v. EPA*, 526 F.2d at 1049, 1061; *cf. American Frozen Food Inst. v. EPA*, 539 F.2d at 142-43.

[172] Section 306 of the Water Quality Act of 1987; 33 U.S.C. § 1311(n).

> limitations for the facility that accurately reflect its situation. The subcategorization approach would add further complications and require potentially substantial additional time in developing what are already extraordinarily complex and detailed national regulations. By contrast, the FDF determination procedure allows both implementation of the national rule and consideration of individual petitions claiming unique factors.[173]

Given Congress' clear intent that the national rulemaking process not be unduly impeded by highly individualized objections to the regulations that would be more appropriately addressed in an FDF proceeding, we address the following claims with this concern in mind.

1. Union Carbide

Union Carbide argues that high influent BODS concentrations at its Taft, Louisiana, plant preclude effective treatment by the model BPT technology. Union Carbide thus contends that the EPA has neither costed nor identified any BPT technology which will enable plants with high-BOD influent to comply with BPT. The EPA costed the addition of a biological treatment unit followed by a secondary clarifier to Taft's existing treatment system.[174] This additional treatment system will remove almost four million pounds of conventional pollutants at an annualized cost of $1,242,220.[175]

The EPA reasonably concluded that the Taft plant was not so fundamentally different from the industry as a whole as to warrant exclusion from the rule simply because the Taft plant had the highest levels of BODS influent in the

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[173] H.R.Rep. No. 189, 99th Cong., 1st Sess. 26 (1985).

[174] Dev.Doc. at VIII-B53, *reprinted in* Joint App. at 4585, 4961-62.

[175] Dev.Doc. at VIII-C1 (plant #296), *reprinted in* Joint App. at 4609; Dev.Doc. at VIII-B2 (plant #296), *reprinted in* Joint App. at 4533.

data base used to develop the limits. The EPA has concluded reasonably that the limitations are both achievable and practicable for the Taft plant.

2. Borg-Warner

Borg-Warner seeks a separate subcategory for wastestreams containing significant amounts of phenol, alleging that high phenol concentrations adversely impact biological treatment by inhibiting biodegradability. The EPA specifically considered the effects of phenol concentrations and found that several plants with high phenol influents achieved low levels of biological oxygen demand.[176] The EPA found that phenol-dominated wastestreams were treatable and therefore declined to create a subcategory for phenol-dominated wastestreams. The EPA's conclusion is supported by the record and is not arbitrary or capricious.

3. DuPont's Chambers Works Plant

DuPont claims that the BPT limits for TSS are not attainable by its Chambers Works plant through the use of the technology relied upon in establishing the regulations. DuPont maintains that the EPA failed to take into account the nature of the wastewaters subject to regulation and specifically failed to take into account the fact that "[d]ue to the complexity and unique aspects of its manufacturing process" the wastestream of the Chamber Works plant contains TSS and mixed liquor suspended solids at significantly higher levels than did the wastestreams of the plants in the EPA's data base. DuPont argues that its wastestream is also fundamentally different from other plants in that its TSS/BODS ratio is nearly four times greater than the average.

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[176] CMA Informal Comments on EPA's Draft Contractors Engineering Report, Nov. 1982, *reprinted in* Joint App. at 4686-94; Dev.Doc. VII-A2, *reprinted in* Joint App. 4411.

While DuPont asserts that the EPA failed in general to adequately consider wastestream characteristics in its subcategorization of the industry, it does not propose any specific basis on which the EPA should have created a subcategory that would address the characteristics of the Chambers Works plant wastestream.[177] Rather, DuPont asserts that the limitations should be set aside because the EPA failed to take into account "unique" characteristics of the wastewater at the Chambers Works plant and rejected data submitted by DuPont that demonstrate the "unachievability" of the TSS limitations.

As we note above, the EPA is not obligated to address in its national rulemaking the fundamentally different characteristics of an individual plant; such concerns are appropriately raised in an FDF variance proceeding.[178] DuPont has filed for an FDF variance, and the claims raised here are more properly addressed in the first instance in that forum. Accordingly, we express no opinion on whether such a variance would be appropriate.

4. Monsanto and Ethyl

Petitioners Monsanto and Ethyl similarly claim that the EPA failed to adequately account for wastewater characteristics in setting BPT limits and that the EPA's subcategorization scheme is therefore unlawful. Monsanto claims specifically that plants using BPT technology may not be able to achieve the EPA's TSS limits where their wastewaters contain high total-dissolved-solids (TDS) levels and that the EPA should have created a separate subcategory for plants that have high levels of TDS in their wastewater. Monsanto maintains that two of its plants will be unable to comply with the TSS limits for this reason.

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[177] To the extent that DuPont challenges the overall reasonableness of EPA's subcategorization, that issue is addressed *supra* in section II.D.

[178] *See* 33 U.S.C. § 1311(n).

Similarly, Ethyl asserts that its Elgin plant will be unable to comply with the TSS limits because the plant's wastestream contains high levels of brine. Ethyl claims that dilution is necessary to treat wastewater with high brine content but that the BPT effluent limits are based on process flow only, without allowing for dilution. Ethyl notes that it may be possible to meet the standards based on effluent only but that the EPA has not identified the appropriate technology for doing so and therefore has not accounted for the cost of such technology in its BPT limitations.

In response to these objections, the EPA asserts that Ethyl failed to submit any comments during the rule-making proceeding that would establish that a plant's TDS levels would preclude compliance or greatly increase the cost of compliance and that only one company in the industry, Monsanto, claimed during the rulemaking to have a compliance problem caused by high TDS levels in its wastestream.[179] The EPA states that it therefore declined to create a subcategory based on TDS levels because there was not sufficient information in the record to demonstrate that any plant in the OCPSF industry could not comply with the TSS limits as a result of elevated TDS levels.

The EPA notes that while CMA also commented on the relationship between TDS and TSS, its comments weighed against the creation of a separate subcategory based on

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[179] The EPA claims that Monsanto did not submit information sufficient to establish a basis for creating a subcategory based on TDS levels. Specifically, the EPA asserts that "Monsanto did not state what OCPSF product/processes, if any, discharge TDS-laden wastewaters and at what frequency such wastewaters are discharged; nor did Monsanto state what portion of the total process wastewater flow contained elevated levels of TDS." The EPA also claims that Monsanto failed to provide data on actual influent TDS and effluent TSS levels to support its claim.

TDS influent levels.[180] The EPA determined that technology does exist to clarify wastestreams with especially high levels of solids and that facilities use a variety of methods to ensure the effective biological treatment of unique wastestreams that contain pollutants that impede biological treatments. The EPA noted, for example, that technologies such as reverse osmosis can eliminate materials in a plant's wastewater which may inhibit or upset biological treatment systems.[181]

In specific response to Monsanto's comment, the EPA stated that three facilities which have TDS levels exceeding 5,000 mg/*l* have nevertheless achieved good TSS removal.[182] The EPA further concluded that few, if any, OCPSF plants have TDS levels of sufficient magnitude to impair TSS removal.[183] Accordingly, the EPA rejected Monsanto's request that a correction factor for high TDS levels be incorporated into the final TSS limits.[184]

Although Monsanto takes issue with the EPA's responses, we conclude that the EPA's decision not to es-

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[180] CMA objected to EPA's proposed influent design limits of 10,000 mg/*l* TDS for activated sludge systems, claiming in general terms that some OCPSF plants successfully "operate with influent TDS levels as high as 15,000-30,000 mg/*l* without significant problems." CMA's November 24, 1982 Comments on EPA's Draft Contractor's Engineering Report, *reprinted in* Joint App. at 4677. CMA stated that while such systems may require more operator attention or special design considerations, they performed satisfactorily and offered economic advantages over other designs. *Id.*

[181] 50 Fed.Reg. 29,075; Dev.Doc. IV-28, *reprinted in* Joint App. at 3527. The EPA also noted that some plants use equalization to blend specific process wastestreams on a controlled basis, into the plant's wastewater treatment system. *Id.*

[182] Agency Response to the July 17, 1985 and October 11, 1985 Notices of Availability of New Information, Comment #166, *reprinted in* Joint App. at 3013-14.

[183] *Id.*

[184] *Id.*

tablish a special subcategory based upon TDS levels was reasonable. The EPA found, based upon the record before it, that it was uncertain at best whether any plant in the industry had TDS levels that precluded effective treatment and that if there were any such problems, they would be unique to Monsanto, the only company to claim TDS problems. Therefore, Monsanto's concerns would be more properly addressed through an FDF variance proceeding than through the national rulemaking.

The EPA notes that, unlike Monsanto, Ethyl never submitted comments—in response to either the proposed regulations or the three subsequent public notices—to inform the EPA that it believed its Elgin plant would experience TSS compliance problems as a result of the level of TDS in the plant's wastewater. Ethyl asserts that it does not suggest that the EPA should have created a separate subcategory for its Elgin plant, but rather submits the argument that the Elgin plant cannot meet the TSS limits as evidence that the EPA failed adequately to consider wastewater characteristics in establishing BPT. To the extent that Ethyl challenges the overall validity of the EPA's subcategorization approach, based on the EPA's alleged failure to adequately consider wastestream characteristics, that issue is addressed above. Furthermore, as we also conclude above, the fact that a single plant may have difficulty in meeting BPT requirements due to unique characteristics of that plant, does not render the entire rulemaking invalid. To the extent that Ethyl does raise concerns unique to its Elgin plant, those issues are properly raised through an FDF variance proceeding rather than through the national rulemaking.

5. FDF Variances

The highly individualized claims of DuPont, Monsanto, and Ethyl are more appropriately addressed in an FDF administrative proceeding. DuPont and Ethyl have filed for variances, and Monsanto may certainly do so in the

near future. Petitioners argue, however, that we may not decline to address their claims because the EPA has not yet ruled on the applications. Thus, petitioners claim that the EPA will leave them in "administrative limbo" while the limitations go into effect. To the extent, however, that petitioners DuPont and Ethyl seek to compel an Agency decision on their FDF applications, such relief is outside the scope of this court's limited jurisdiction under CWA Section 509(b)(1) to review the EPA's effluent limitations guidelines, pretreatment standards, and new source performance standards.[185]

This court would have jurisdiction to review the FDF claims only after the EPA has ruled on petitioners' applications and after review by the district court.[186] The Act's regulatory scheme is consistent with the prudential doctrine of primary jurisdiction which holds that complex scientific and technical issues, such as those presented here, should be resolved in the first instance by the EPA, the entity best suited to pass on these issues.[187]

Congress was aware of the difficulty and corresponding delays in processing FDF variance applications for individual plants.[188] Accordingly, Congress attempted to expedite the process by specifically requiring the EPA to determine the merits of applications for FDF variances for individual plants within 180 days of the submission of the application.[189] Thus, the WQA ensures that all FDF ap-

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[185] 33 U.S.C. § 1369(b)(1).

[186] *Id.*

[187] *McKart v. United States*, 395 U.S. 185, 194, 89 S.Ct. 1657, 1662, 23 L.Ed.2d 194 (1969).

[188] S.Rep. No. 50, 99th Cong., 1st Sess. 20-21 (1985).

[189] Water Quality Act of 1987 (WQA), 33 U.S.C. § 1311(n)(3). Additionally, the WQA treats all FDF applications that were still pending on the date of enactment as having been submitted to the Agency on the 180th day following the date of enactment, and therefore, as falling within the ambit of the WQA itself. 33 U.S.C. § 1311(n)(5).

plications on which the EPA had not previously ruled would henceforth be subject to the Act's 180-day time limit.

Notwithstanding Congress' 180-day deadline, the EPA admits that historically it has taken, on average, three years to process an FDF application. The EPA believes that it may require more than 180 days to complete the review of these highly technical applications. However, the fact that the Agency has exceeded the statutory time limit for issuing its decision on the OCPSF FDF applications does not permit this court to order the EPA to produce a schedule for rendering its decisions. Congress provided an explicit statutory deadline for these decisions which specifically contemplates that efforts to compel timely Agency action would be heard exclusively in the district courts.[190] Nevertheless, petitioners argue that because of this delay, and because the OCPSF limitations will require them to install costly control technology, this court should stay application of the OCPSF limitations pending the EPA's consideration of the FDF applications.

Section 509(b)(1)[191] of the CWA authorizes the courts of appeal to review the effluent-pollution limitations promulgated by EPA. Only the rulemaking proceedings are subject to this court's review under Section 509(b)(1), however, and the petitioners do not challenge the promulgation of the regulations. Rather, they challenge the implementation or application of the regulations and such a challenge is not subject to this court's review under Section 509(b)(1). The industrial petitioner's claim that the EPA has failed to consider their FDF applications in a timely manner, therefore, even if true, does not undermine the legality of the regulations because an FDF proceeding is collateral to the rulemaking proceedings.

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[190] 33 U.S.C. § 1365(a)(2).

[191] 33 U.S.C. § 1369(b)(1).

A challenge to the implementation or application of the regulations may be brought in a civil action under CWA Section 505(a)(2), which provides:

> any citizen may commence a civil action . . . against the Administrator where there is alleged a failure of the Administrator to perform any act or duty under this Act which is not discretionary with the Administrator.[192]

A civil action under Section 505(a)(2) must be commenced in the district court.

In addition, the relief requested by the petitioners is precluded by the Act. The Act provides:

> An application for an alternative requirement under this subsection [i.e., an FDF application], shall not stay the applicant's obligation to comply with the effluent limitation guideline or categorical pretreatment standard which is the subject of the application.[193]

Staying the regulations pending petitioners' FDF applications would be contrary to Congress' expressed intent that the effluent limits be enforced notwithstanding a pending FDF application.

Finally, the petitioners argue that denial of a stay will require them to install millions of dollars of technology that may prove to be redundant if they are later granted FDF variances. This seems to be the possible result of the Congressional pattern in requiring enforcement of the regulations before final action on applications for FDF variances. The impact of this requirement is, however, lessened by the likelihood that, even of each of the petitioners is eventually granted an FDF variance, each will likely be required to meet standards that require the installation of

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[192] 33 U.S.C. § 1365(a)(2).

[193] 33 U.S.C. § 1311(n)(6).

some new methods of pollution control. An FDF variance would not exempt petitioners from the limitations; it would merely subject them to less stringent limits using the best technology.[194]

III. *Best Available Technology (BAT) Issues*

Section 301(b)(2) of the Clean Water Act [195] requires the EPA to establish effluent limitations for toxic substances ("toxics") based on the "*best available technology* economically achievable" (BAT). Congress intended these limitations to be based on the performance of the single best-performing plant in an industrial field.[196] The BAT standards promulgated by the EPA separate regulated plants into two subcategories and fix different limitations for each of these subcategories. Subcategory 1 (BAT_1) consists of plants that utilize end-of-pipe biological-treatment systems, that is, systems in which biological processes are used to treat wastewater after all plant processes have been completed and immediately before discharge of the effluent into a navigable stream. Subcategory 2 (BAT_2) consists of plants that remove pollutants while the wastestream is still in the plant; in-plant methods include biological treatment, activated carbon absorption for organic pollutants, chemical precipitation for metals, and alkaline chlorination for cyanide.[197]

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[194] *See* 33 U.S.C. § 1311(n)(1)(C) & (D).

[195] 33 U.S.C. § 1311(b)(2).

[196] 1972 Leg.Hist. at 170; *Kennecott v. EPA*, 780 F.2d at 448.

[197] 52 Fed.Reg. 42,539-44.

A. The EPA's Statistical Method of Developing the BAT Limitations

1. The EPA's Use of Weighted Averaging in Deriving the Long-Term Averages

To derive the BAT limitations the EPA averaged over a long term the amount of the toxic discharged by what it considered to be the best plant or plants in the data base using BAT technology. It then multiplied this "long-term average" by a "variability factor," a number always greater than one, to account for its estimate of the reasonable variation from the average that could be expected by the several best-performing plants in the data base. The product was the BAT limitation for that toxic.

A toxic may be present in a discharge in such a small amount that it cannot be detected by state-of-the-art analytical methods, that is, the amount of a toxic may be less than the "analytical minimum." Generally, the analytical minimum for the detection of a toxic is 10 parts per billion (ppb), a proportion that, following an analogy employed by CMA at oral argument, is comparable to one minute in two thousand years. For the purpose of calculating long-term averages the EPA assumed that the amount of an undetected substance contained in a discharge (the "non-detect value") equalled the analytical minimum; in other words, if the toxic might be present, but only in such a small concentration that it could not be detected by currently-used analytical methods, the EPA assumed the toxic was present at the analytical minimum, generally 10 ppb. None of the petitioners objects to the EPA's use of non-detect values in the calculation of long-term averages, presumably because assigning the analytical minimum to a reading in which a specific toxic could not be detected had the effect of raising the long-term average and thus raising the effluent limits. CMA objected

to weighted averaging of such values, however, because this lowered the limitations.

The long-term averages were calculated by averaging detectable values and non-detect values. The EPA calculated the average of the assigned non-detect values and the average of detectable values for the data base and then weighted the averages according to the proportions of all non-detect and detectable values reported for plants in the data base for a given pollutant. The long-term average for a particular plant was calculated as the weighted sum of the averages of detect and non-detect values reported for plants in the data base.[198]

CMA contends that the EPA's weighted averaging of non-detect values significantly lowered the long-term averages it calculated from measured effluent concentrations, and thus lowered the OCPSF effluent limits for at least 27 pollutants. CMA concludes that this was without "justification or support," hence arbitrary.

The choice of statistical methods is committed to the sound discretion of the Administrator.[199] Weighted averaging is a recognized statistical method for adjusting a data set when the data for particular units, plants in this case, are not represented by a comparable number of readings or samples. When some units in a data set are represented by fewer readings than other units in the set, the units represented by fewer readings should be given less weight in the average, i.e., discounted through weighted averaging. Conversely, those units in a data set based on a larger number of readings should be given greater weight in the average. Including a unit for which there is a smaller number of readings in a calculation,

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[198] 50 Fed.Reg. 29,080 (July 17, 1985).

[199] *BASF Wyandotte Corp v. Costle*, 598 F.2d at 655.

without discounting it by weighted averaging, would distort the average.[200]

CMA correctly contends that use of a different averaging method would yield different results. Indeed, several different methods might have been used, each producing a different result. As the First Circuit has noted, however, "[t]he choice of any given method may mean that an alternative method would yield different results. The necessary corollary . . . is that any other system chosen would be open to the same criticism. We will not leave the Agency so vulnerable."[201] We agree, provided, of course, that there is no demonstration that the Agency's method was chosen arbitrarily or merely for the purpose of achieving a predetermined prejudicial effect. The EPA's use of weighted averaging to determine the long-term averages was not an abuse of discretion.

2. Averaging of Variability Factors

The same plant using the same treatment method to remove the same toxic does not always achieve the same result. Tests conducted one day may show a different concentration of the same toxic than are shown by the same test the next day. This variability may be due to the inherent inaccuracy of analytical testing, i.e., "analytical variability," or to routine fluctuations in a plant's treatment performance.

The EPA attempted to take this variability into account. To do so, it calculated the BAT limitations by multiplying the long-term average concentration of each pollutant by a variability factor that reflected observed variations in treatment performance experienced by plants that had at-

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[200] *See generally* R. Steel & J. Torrie, Principles and Procedures of Statistics 252-268 (1960); J. Freund, Modern Elementary Statistics 67-68 (2d ed. 1960); S. Richmond, Statistical Analysis 41-43 (2d ed. 1964).

[201] *BASF Wyandotte Corp v. Costle*, 598 F.2d at 655.

tempted to remove that pollutant. The EPA computed the variability factor for each plant in the BAT data base for that pollutant or, if there were two or more plants with a significant number of data points in the detectable range, it averaged the variability factors for all the plants.

CMA asserts that averaging variability factors from different plants assumes that the plants are similar, an assumption that is not supported by the record, and that the EPA has failed to show that the different plants can reduce the amount of variability to the factor computed by the EPA. CMA further contends that the EPA should have created separate subcategories to account for the different variability experienced by the various types of plants using BAT.

As the EPA notes, averaging variability factors inures to the benefit of the industrial petitioners because it yields a greater variability factor than the factor that would have resulted from using data from the single plant that experienced the least variability. The EPA decided not to subcategorize BAT plants on the basis of variability because the EPA determined that OCPSF plants utilizing BAT could achieve uniformly high levels of removal of toxics.[202]

The reasonableness of the variability factors used by the EPA is supported by the record.[203] Moreover, CMA has failed to demonstrate that the greater variability measured at some plants is due to uncontrollable factors rather than plant inefficiencies or that the fact of such greater variability shows that the limitations are not achievable.

B. Remedy for Unavoidable Exceedances

Petitioners PPG and Dow assert that the EPA's statistical model demonstrates that a well-operated plant using

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[202] Dev.Doc. IV-38-39, 41, *reprinted in* Joint App. 3537-38, 3540.

[203] *See American Petroleum Inst. v. EPA*, 540 F.2d at 1035-36.

BAT can be expected to perform within the daily effluent limitations only 99 percent of the time and within the monthly effluent limitations only 95 percent of the time. They contend that the regulations are unachievable, hence arbitrary, because the model implies that exceedances, i.e., toxic discharges in excess of the BAT limitations, can be expected to occur an average of one percent of the time on a daily basis and five percent of the time on a monthly basis. The regulations, they assert, do not provide a remedy for such unavoidable exceedances.

This argument is based on an apparent misunderstanding of the EPA's statistical model. The EPA developed two variability factors for each pollutant—a maximum daily variability factor and a maximum monthly variability factor. To develop the variability factors, the EPA fit the data for each pollutant at each plant to a statistical distribution curve that graphed discharge levels (represented on the horizontal axis) against the probability of the particular discharge occurring (represented on the vertical axis). For the daily data distributions, the EPA estimated both the mean and the level below which 99 percent of the discharge measurements fell for each pollutant at each plant; for the monthly data, the EPA estimated both the mean and the level below which 95 percent of the discharge measurements fell for each pollutant at each plant. The EPA then divided the 99th and 95th percentile figures by the respective means of daily and monthly distributions to determine plant-specific daily and monthly variability factors.[204] Finally, the EPA averaged plant-specific variability factors for all of the plants in the data base to determine a daily and monthly variability factor for each pollutant.[205]

The data points reflecting discharge levels in excess of the 99th and 95th percentiles represent extreme depar-

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[204] Dev.Doc. VII-F1-F13, *reprinted in* Joint App. 4448-59.

[205] Dev.Doc. VII-207, 211, *reprinted in* Joint App. 3907, 3911.

tures from the mean and were not used by the EPA in calculating the variability factors. The industrial petitioners apparently argue that, because the model technology produced these data points and because these points were not used in determining the variability factors, the limitations are not achievable using the model technology.

The EPA did not use the data points in excess of the 99th and the 95th percentiles in calculating the variability factors because it thought that these extremes were due to plant quality-control problems, not unavoidable exceedances. It determined that these variations could be controlled by quality-control methods such as frequent inspection and repair of equipment, use of back-up systems, operator training and performance evaluations, management control, careful communications and coordination among production and wastewater treatment personnel, spill diversion and holding systems, and equalization basins to make wastewater flow and quality more uniform. The EPA also determined that "use of these techniques should result in compliance *at all times* apart from instances of upsets."[206]

The industrial petitioners argue that the EPA has not adequately demonstrated that the data points exceeding the 99th and 95th percentiles represent controllable rather than uncontrollable variability. The EPA's conclusion that these data points result from quality-control problems is, however, reasonable because these points are isolated and extreme departures from average performance. "The purpose of these variability factors is to account for routine fluctuations that occur in plant operation, not to allow for poor performance."[207] The data points exceeding the 99th and 95th percentiles, by definition extreme, do not reflect routine performance, and were reasonably excluded.

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[206] 52 Fed.Reg. 42,564 (emphasis added).

[207] *FMC Corp v. Train*, 539 F.2d at 986.

In any event, the EPA has provided an exception for unavoidable exceedances. The regulations provide that an unavoidable exceedance caused by an "upset" is an affirmative defense in an action for noncompliance.[208] The regulations define an "upset" as

> an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.[209]

It is not clear whether upsets were included in the data used by the EPA to calculate the variability factors. At one point the record states that upsets were edited from the data; however, the record also states that the EPA used all data collected from the data-base plants.[210] We need not resolve this discrepancy. The EPA reasonably concluded that the data points exceeding the 99th and 95th percentiles represent either quality-control problems or upsets because there can be no other explanation for these isolated and extremely high discharges. If these data points result from quality-control problems, the exceedances they represent are within the control of the plant. If, however, the data points represent exceedances beyond the control of the industry, the upset defense is available.

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[208] 40 C.F.R. § 122.41(n)(2).

[209] 40 C.F.R. § 122.41(n)(1).

[210] Dev.Doc. VII-185, *reprinted in* Joint App. 3885; Admin.R. 108421-24, 108456-57, 108514-16, 108577-79, 108758-60.

C. The EPA's Analytical Methodology

1. Analytical Variability

The analytical methods for measuring pollutants become unreliable at the low concentrations the EPA has established in the limitations. Two different laboratories, each using acceptable methods, may measure the pollutant in a given sample and reach different results, yet neither lab may be demonstrably wrong. This has been referred to above as "analytical variability." Monsanto, Dupont, and CMA contend that the BAT limits cannot be achieved because analytical variability will in some instances inevitably result in a detection reading (or laboratory measurement) in excess of the limitations even though the "true" value of the sample is within the limits.

The EPA responds by asserting that analytical variability was adequately accounted for in its derivation of the BAT limitations. As previously discussed, the variability factors were derived from empirically-observed variations in measurements due either to analytical variability or to routine fluctuations in a plant's performance. To calculate the BAT limits, the EPA multiplied the long-term averages by the variability factor, and because it did so, the EPA asserts, its statistical model necessarily accounts for analytical variability.

The record shows, and the EPA concedes, that certain pollutants are subject to substantial analytical variability. In review proceedings, however, the burden is on the petitioner to show that the Administrator's determination was arbitrary, capricious, or an abuse of discretion.[211] The industrial petitioners have not shown that the variability factors the EPA assigned to the respective pollutants failed to account for analytical variability, and therefore the petitioners have failed to meet their burden.

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[211] *Louisiana Environmental Society v. Dole*, 707 F.2d at 119.

2. Complex Wastestreams

Many of the OCPSF plants use a variety of processes to produce a number of different organic chemicals or plastics, and as a result, the wastestreams from these plants include several pollutants, making the wastestreams "complex." Monsanto and Dow contend that current analytical techniques cannot reliably measure low pollutant concentrations in a complex wastestream due to interference from other chemicals and that, therefore, the low effluent levels required by the BAT limitations cannot be achieved by their plants.

The EPA has developed comprehensive "Guidelines Establishing Test Procedures for the Analysis of Pollutants," known as "Part 136."[212] The EPA has determined "minimum levels" at which these analytical techniques can reliably measure the concentration of a pollutant without interference from other pollutants through a calibration process by which the known concentration of each pollutant is analyzed. The EPA has determined that the limitations are all well above the minimum levels for reliable detection.[213]

The EPA purports to have accounted in this fashion for the problems of analytical uncertainty and interference from other compounds. Monsanto's and Dow's contentions amount to the argument that their studies are contrary to the EPA's and that their studies show the BAT limitations to be within a range that will be affected by analytical uncertainty and interference. This issue turns on a question of analytical chemistry that this court could not resolve without performing independent laboratory work, and that is beyond both its power and its technical capacity. When reviewing an agency's scientific determinations in an area within the agency's technical expertise,

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[212] 40 C.F.R. Part 136.

[213] 52 Fed.Reg. 42,563.

a reviewing court must be at its most deferential.[214] We defer to the EPA's determination of this issue.

3. Computation of Variability Factors When Data Were Insufficient ("Borrowed Data")

When the EPA had not obtained sufficient plant variability data to calculate the variability factor for a pollutant, it used the average of those variability factors that it had established for other similar pollutants or, if no such average had been calculated, for all of the pollutants subject to the BAT limitations. CMA contends that the EPA's use of this "borrowed data" to determine the variability factor for a pollutant when data were not otherwise available was "sheer guesswork."

For the BAT_1 limitations, when data were not otherwise available, the EPA determined the variability factor by using data from pollutants exhibiting similar "chemical structure and characteristics" that bear on treatability. This was based on the reasonable assumption that similar compounds react similarly to similar treatment. For BAT_2, when direct data were not available, the EPA computed variability factors by averaging the variability factors for all other pollutants that the EPA found to be treatable by the same technology. The EPA has established a reasonable basis for its use of borrowed data.[215] Its assumptions are logical and there is nothing in the record to establish that they led to scientifically inaccurate results.

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[214] *Baltimore Gas & Electric Co. v. NRDC*, 462 U.S. 87, 103, 103 S.Ct. 2246, 2255, 76 L.Ed.2d 437 (1983); *see also Weyerhaeuser Co. v. Costle*, 590 F.2d at 1061.

[215] *See BASF Wyandotte Corp. v. Costle*, 598 F.2d at 656.

4. CMA's Challenge to the EPA's Choice of the Minimum Analytical Value to Assign to Non-Detect Readings

To calculate the long-term averages for plants in the data base the EPA included non-detect values. As previously discussed, the value assigned to a non-detect reading was the minimum analytical value. To derive the limitations for the polynuclear aromatics, the EPA assigned to these pollutants the published minimum analytical value of 10 ppb that appears in Part 136.[216]

The BAT_2 limitations for the polynuclear aromatics were based on data from plant 1293T.[217] CMA notes that the EPA lab reported an average minimum analytical value of 13.3 ppb for this plant. CMA asserts that the published Part 136 minimum analytical values were determined based on pollutant samples in "pure reagent water" free of other interfering chemicals and do not account for real-world interference from other compounds that raise the minimum analytical value, such as the reported minimum analytical value at plant 1293T. CMA argues that the EPA therefore erred by using the published minimum analytical value, rather than the lab-reported average minimum analytical value for plant 1293T, and this error of 3.3 ppb made the limitations more stringent.

The EPA's methodology for deriving the effluent limitations included several conservative assumptions that created a margin for error and ensured that the limitations are achievable.[218] The first of these conservative assumptions is that when a data base plant reported a non-detect

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[216] 40 C.F.R. Part 136, App. A, Method ## 1624 and 1625, Tables 2 and 8 respectively.

[217] Dev.Doc. VII-209, *reprinted in* Joint App. 3909.

[218] *See State of California v. EPA*, 774 F.2d 1437, 1442-43 (9th Cir.1985); *Mision Industrial, Inc. v. EPA*, 547 F.2d 123, 128-29 (1st Cir.1976).

reading, the EPA assigned the minimum analytical value to such a reading.[219] By assigning the minimum analytical value, rather than zero, to plants that reported non-detect readings, the EPA raised each plant's long-term average above the "true" treatment level achieved by the plant. This resulted in higher, less stringent, limitations than would have been imposed if the EPA had assigned a zero to non-detect readings.[220] Second, in calculating the variability factors for each pollutant, the EPA did not use data from plants that consistently reported non-detect readings.[221] Consequently, data from the best performing plants were not used to derive the BAT variability factors, thus awarding higher BAT limitations. The EPA's error, if any, in using the published Part 136 minimum analytical value, rather than the wastestream-specific value reported for plant 1293T, was, therefore, offset by the EPA's conservative methodology used to develop the BAT limitations.

The record shows that the BAT_2 limitations based on data from plant 1293T are achievable.[222] The lowest of the effluent limitations based on the performance of this plant is well above the minimum analytical level whether 10 ppb or 13.3 ppb is used. For instance, the BAT_2 maximum daily limitation for benzo(k)fluoranthene is 47 ppb, while the maximum monthly average is 19 ppb.[223] The data show that plant 1293T performed within these limits whether the minimum analytical value is 10 ppb or 13.3 ppb.[224]

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[219] Dev.Doc. VII-186, 201, *reprinted in* Joint App. 3886, 3901.

[220] Dev.Doc. VII-217-18, *reprinted in* Joint App. 3912-18.

[221] Dev.Doc. VII-211, *reprinted in* Joint App. 3911.

[222] *See, e.g., National Asphalt Pavement Ass'n v. Train*, 539 F.2d 775, 787 (D.C.Cir.1976).

[223] 52 Fed.Reg. 42,582 *to be codified at* 40 C.F.R. 414.101.

[224] Admin.R. 115,761, *reprinted in* Joint App. 5421.

CMA also asserts that at least one plant reported minimum analytical values of 100 ppb for toluene and chloroethane and 60 ppb for chlorobenzene. CMA contends that the EPA erred by assigning the Part 136 minimum analytical value of 10 ppb to toluene and chlorobenzene and 50 ppb to chloroethane in promulgating the limitations.

The EPA asserts that the reported minimum analytical values of 100 ppb for toluene and chloroethane and 60 ppb for chlorobenzene were not representative of the data as a whole and that these data should have been excluded from its calculation of the limitations. The EPA attributed these extremely high minimum analytical values at one plant to dilution due to interference from other chemicals. The EPA's data-editing criterion was to exclude data from plants whose samples could not be measured down to the minimum levels listed in Part 136. Thus the data associated with the extremely high analytical minimums identified by CMA should have been excluded. If these data had been excluded the limitations would have been the same, based on the remaining data, because in calculating the limitations the EPA relied on the median performance of the best plants and the vast majority of the readings for toluene, chlorobenzene, and chloroethane were nondetect readings with minimum analytical values equal to those assigned in Part 136.[225] Because the limitations based on the other data would have been the same even if the EPA had excluded the objectionable data, the EPA's error in including these data in the data base was harmless.

5. Changes in Analytical Methods

The EPA's analytical methods for determining pollutant concentrations were developed during the rulemaking period. Part 136 was later amended to provide newer, more accurate analytical methods. Monsanto argues that apply-

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[225] Admin.R. 115,137, 115,139, 115,151, *reprinted in* Joint App. 5184, 5186, 5198.

ing one analytical method for the development of the OCPSF limitations and another more accurate standard for enforcement produced anomalous results and that, therefore, the limitations are arbitrary.

Current Part 136 outlines several approved analytical methods reflecting both old and new methods for measuring pollutants. An industry member that believes it can record lower measured pollutant-effluent values using the older methods is permitted to do so.[226] Because Part 136 provides industry members with a choice of several analytical methods for reporting purposes, the industrial petitioners were not prejudiced by changes in analytical methods in the development of the limitations.

D. Use of Minimum Analytical Values for Enforcement Purposes

DuPont and Hardwicke assert that the BAT limitations for some toxics are very close to their minimum analytical values. The petitioners argue that a non-detect reading should be considered zero for enforcement purposes.

Although the EPA states in its brief that, to be consistent with its approach in calculating the BAT limitations, "it would be reasonable" to treat non-detect values as the analytical minimum, it is not clear that the Agency has adopted this position as its policy, for neither the regulations nor the development documents address it.

The issue presented is therefore not ripe for review. In *Abbott Laboratories v. Gardner*,[227] the Supreme Court stated that the doctrine of ripeness is intended to prevent the courts from entangling themselves in premature abstract discussions of administrative policies, and "to protect agencies from judicial interference until an

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[226] *See* 40 C.F.R. § 136.3(a) (1987).

[227] 387 U.S. 136, 148-49, 87 S.Ct. 1507, 1515-16, 18 L.Ed.2d 681 (1967).

administrative decision has been formalized and its effects felt in a concrete way by the challenging parties." To further these purposes, the Supreme Court held that whether a controversy is "ripe" requires a court "to evaluate both the fitness of the issues for judicial decision and the hardship to the parties of withholding court consideration."[228]

Because the EPA has not formally adopted a position our discussion of the validity of what it might do would be merely advisory. Withholding court consideration will not result in substantial hardship to the petitioners because enforcement proceedings have not taken place. If there is any merit to their argument, the issue can be addressed in enforcement proceedings. Finally, "the possibility that the petitioner may have to make capital budgeting decisions under a cloud of uncertainty" does not amount to the requisite hardship when the petitioners do not face sanctions for non-compliance.[229]

E. The EPA's Sampling Techniques

CMA asserts that in developing the BAT data base the EPA used sampling points that contained non-OCPSF process water, and thus the resulting limitations are based on lower concentrations due to dilution. In its petition for review CMA identifies five plants where it claims samples were taken at points including non-OCPSF flow. CMA contends that the limitations should be adjusted to account for this dilution.

To accurately measure BAT-treatment performance wastestream samples must be taken before (influent sampling) *and* after (effluent sampling) BAT treatment. If dilution occurs after influent sampling, but before effluent sampling, then the effluent sample represents dilution as

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[228] *Id.*

[229] *NRDC v. EPA*, 859 F.2d 156, 166 (D.C.Cir.1988).

well as treatment performance and the long-term average is inflated by dilution. If, however, dilution occurs before influent sampling, the dilution has no effect on the measure of treatment performance, provided the influent to the treatment system contains a sufficient "threshold" concentration of a pollutant.[230]

The EPA states that to sample influent it established sampling points only at locations where OCPSF process wastewater flows were not later significantly diluted by non-process flows.[231] The EPA determined that the dilution at the five plants identified by CMA occurred before the BAT treatment stage and before the points at which influent samples were taken. The record also shows that the influents at these five plants contained sufficient toxics to meet the "threshold" for meaningful measurement of each plant's treatment performance.[232] Thus the samplings at the five plants identified by CMA served as an accurate measure of BAT treatment performance.

F. The EPA's Toxic Limitations

1. Application of the Toxic Limitations to All OCPSF Dischargers

The effluent limitations subject each discharger to the BAT limits for all regulated toxic pollutants.[233] Pursuant to the EPA's existing NPDES regulations, the permit writers will establish monitoring requirements for toxics on a case-by-case basis, but each plant must be monitored for each pollutant at least once per year.[234]

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[230] Dev.Doc. VII-193, *reprinted in* Joint App. 3883.

[231] 1985 Comment Responses (Oct. 2, 1987) # 36 at 46, *reprinted in* Joint App. 2983.

[232] Admin.R. 115602-08, 115624-32 115679-90, *reprinted in* Joint App. 5386-92, 5393-401, 5402-13.

[233] 52 Fed.Reg. 42,532, 42,557-58, 42,481. (codified at 40 C.F.R. §§ 414.91, 414.101).

[234] 40 C.F.R. §§ 122.44(8) and 122.48.

Courtaulds and Ethyl argue that requiring all dischargers to monitor for compliance with the BAT_1 limitations for all toxic pollutants is arbitrary because this will require expensive monitoring and some toxics are not likely to be present in particular wastestreams. They urge that they should be required to monitor only for those toxics likely to appear in their wastestreams.

The EPA contends that this challenge to the monitoring requirement is not ripe for review because monitoring requirements will be, but have not yet been, established on a case-by-case basis. The EPA's response misses the point. The petitioners are not directly challenging the frequency of monitoring but the requirement that *all* dischargers must monitor their effluents for *all* toxics, not only for those that could be expected to be found. This issue is therefore ripe for review.

On the merits the EPA states that its requirement that all dischargers must comply with the effluent limitations for all priority pollutants is based on evidence and comments indicating that OCPSF plants engage in such diverse production processes that they cannot guarantee against the existence of priority pollutants in their wastestreams.[235] Therefore, the EPA argues, its regulations must be industry-wide. Furthermore, the EPA points out that the regulations provide that monitoring frequencies will be established on a case-by-case basis by the individual NPDES permit writer, taking into account the likelihood that certain pollutants will or will not be found in a particular discharger's wastestream.[236]

The EPA has provided a rational reason for the need for an industry-wide rule and has provided a flexible mechanism for the mitigation of any harsh economic consequences of the rule. The rule is therefore not arbitrary.

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[235] 52 Fed.Reg. 42,557.

[236] 52 Fed.Reg. 42,557-58.

2. Courtaulds' "Notice and Comment" Challenge

Courtaulds claims that the EPA failed to give adequate notice that it intended to subject all dischargers to the limitations for all toxics. In a 1985 notice of proposed rulemaking the EPA announced:

> *EPA has decided to promulgate a single set of BAT limitations which would be applicable to all OCPSF facilities.* (However, permits would tailor these requirements somewhat to account for the fact that most OCPSF plants routinely discharge only a subset of pollutants covered by the BAT limitations . . .).[237]

The notice listed three options the EPA was considering for establishing monitoring requirements. The first of these options, and the one ultimately adopted by the Agency, stated:

> (1) *Limiting all pollutants covered by the regulation in the permit and as a pretreatment standard,* but requiring frequent monitoring only for pollutants of concern. Other pollutants would be monitored for compliance only occasionally (e.g., once or twice per year).[238]

The notice made it clear that the EPA was considering subjecting all dischargers to the limits for all toxics. Courtaulds' challenge is without merit.

3. The *NRDC v. Train* Consent Decree

Courtaulds also claims that the EPA violated section 8(a)(iii) of the consent decree in *NRDC V. Train,* which provides that the EPA "may" exclude from regulation

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[237] 50 Fed.Reg. 29,079 (emphasis added).

[238] 50 Fed.Reg. 29,094 (emphasis added).

pollutants found only in trace amounts.[239] Although the decree provides that the EPA "may" exclude such pollutants from regulation, nothing in the consent decree requires the EPA to do so. Even if, therefore, this is the proper court in which to complain of noncompliance with the decree, a point we do not decide, no such violation has been shown.

G. NRDC's Challenge to the EPA's BAT_1 and BAT_2 Subcategorization

The EPA divided the BAT limitations into two subcategories, BAT_1 and BAT_2. BAT_1 limits are based on a model technology that added various in-plant treatment systems to end-of-pipe biological treatment. EPA recognized that some plants with low influent BODS levels to not have enough waste "nutrients" to support their treatment biota; such plants, therefore, will be unable to maintain an end-of-pipe biological treatment system.[240] In response to this problem, the EPA derived the BAT_2 limits based on a variety of in-plant treatment systems. The EPA stated that the plants subject to the BAT_2 limits are those plants that do not employ end-of-pipe biological treatment. The result of this rule is that plants that can find a way to comply with the BPT limitations without installing end-of-pipe biological treatment systems are subject to the less stringent BAT_2 limitations.[241]

NRDC argues that the EPA's adoption of the BAT_1 and BAT_2 subcategories violated the APA notice and comment requirement because this subcategorization was presented for the first time in the final rule. NRDC also asserts that

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[239] 8 Env't Rep.Cas. at 2126.

[240] *See* 50 Fed.Reg. 29,076.

[241] The BAT_2 subcategory does not regulate four toxic pollutants which are regulated under the BAT_1 limitations. Moreover, for the pollutants regulated, in general the BAT_2 subcategory results in poorer effluent quality than the BAT_1 subcategory.

this type of BAT subcategorization violates the CWA because it allows a discharger who chooses not to employ end-of-pipe treatment to be subject to less stringent BAT_2 limits. NRDC states that, if it had had an opportunity to comment, it would have urged the EPA to establish a single numerical BODS influent parameter which would define whether a plant was in the BAT_1 or BAT_2 subcategory. This number would presumably be based in part upon the EPA's judgment regarding the required influent BODS concentration required to effectively operate an end-of-pipe biological system; plants falling below the required BODS influent level would qualify for BAT_2 subcategorization.

We agree that the EPA failed to present its BAT subcategories for comment as required by APA § 4(c). The EPA has failed to direct this court's attention to any public notice announcing its BAT subcategories prior to promulgation of the final limitations. In fact, the record indicates that prior to final promulgation of the limitations the EPA announced that it did not intend to establish any subcategories for BAT. The record states:

> EPA considered whether the industry should be subcategorized for BAT purposes by evaluating the same subcategorization factors which were considered for BPT. *EPA has decided to promulgate a single set of BAT limitations which would be applicable to all OCPSF facilities.* . . . The available data for BAT show that plants . . . can achieve similar low toxic pollutant effluent concentrations by installing the best available treatment components. . . . Therefore, *the Agency believes that BAT subcategories do not appear to be necessary for effective, equitable regulation.* However, EPA will continue to explore the possibility of subcategorizing the industry for BAT purposes and in-

> vites comments and supporting data on appropriate approaches.[242]

The last sentence notwithstanding, this notice was not sufficient to fairly apprise interested parties that BAT subcategorization was still a live issue; rather the notice gives every indication that the issue had been laid to rest.

We remand this issue to the EPA for notice-and-comment proceedings.[243] In the interim, the limitations will be given effect[244] for three reasons: First, we recognize Congress' concern for limiting the discharge of toxic pollutants within the statutory deadline. Second, the notice-and-comment proceedings may disclose that the BODS parameter urged by the NRDC is neither necessary nor feasible. Finally, the industrial petitioners are not prejudiced by being subjected to BAT_2 limitations which, if anything, may be too lenient.

H. DuPont's Chambers Works Plant

DuPont claims that the wastewater of its Chambers Works plant is highly concentrated, with 50 of the 63 priority pollutants subject to the limitations, and the EPA failed to consider the unique nature of this plant in determining whether the BAT_1 limitations for volatile organic pollutants are achievable. DuPont contends that the BAT_1 limitations were derived from a data base with plants that had relatively simple wastestreams and therefore the limitations cannot be achieved by plants with complex wastestreams such as its Chambers Works plant. DuPont seeks either a subcategory containing only the Chambers Works plant or an exemption from the BAT_1 limitations.

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[242] 50 Fed.Reg. 29,079.

[243] *See* 33 U.S.C. § 1369(c).

[244] *See Western Oil & Gas Ass'n v. EPA*, 633 F.2d 803, 813 (9th Cir. 1980).

The CWA directs the EPA to establish BAT pollutant "effluent limitations for categories and classes of point sources."[245] In promulgating nationwide pollutant effluent limitations the EPA need not consider the hardship faced by a particular plant. Congress intended "fundamentally different" characteristics of particular plants to be considered by the EPA in a Section 301(n) FDF variance proceeding.

I. BAT Limitations for Phenol

1. Phenol-Dominated Wastestreams

Borg-Warner asserts that the BAT limitations for phenol are unachievable for its Westmar plants and other plants with wastestreams containing high concentrations of phenol. Borg-Warner argues that the EPA should have established a separate subcategory for such plants.

The EPA determined that phenol is "highly biodegradable," and is therefore readily susceptible to biological treatment.[246] To derive the BAT limits for phenol the EPA used data from 23 plants and took 178 samplings.[247] As Borg-Warner notes, four of the data-base plants had influent phenol concentrations higher than those at Borg-Warner's Westmar plant. None of these four plants reported an exceedance of the limitations; the vast majority of the samplings from these plants were below the detectable level.[248] The data from these four plants establish that the phenol limits are achievable for plants with phenol-dominated wastestreams.

Borg-Warner argues that the limits are based on unrepresentative data because the EPA took very few sam-

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[245] 33 U.S.C. § 1311(b)(2)(A).

[246] Admin.R. 103,639, *reprinted in* Joint App. 3029.

[247] March 21, 1983 Responses to Comments at 397, *reprinted in* Joint App. 2965.

[248] Admin.R. 115,444-451, *reprinted in* Joint App. 5332-39.

ples from the four data-base plants with phenol-dominated wastestreams over a relatively short period of time. The record shows that for data-base plants 306 and 1494 the EPA took three samples at each plant over a three-day period; for plant 2711 the EPA took two samples over a two-day period; and for plant 1293 the EPA took fifteen samples over a nineteen-day period.[249] While Borg-Warner contends that the samplings at the first three of these plants are not representative it has neither provided a bench mark nor demonstrated why sampling over a two- or three-day period is not sufficient. Merely asserting that the sampling was inadequate does not make it so.

In any event, the data from the last of these four plants were taken over a substantially longer period of time and these data are consistent with the performances of the other three plants; this confirms that the data on the whole are representative. The number of data points relied on by the EPA was not insignificant, and "there must exist some reasonable termination point in the process of data collection."[250] The petitioners have failed to demonstrate that the EPA's choice of that termination point was unreasonable.

2. The EPA's Cost Estimates for the Phenol Limitations

The EPA designated biological treatment as the model technology for the removal of phenol. To estimate the industry costs of the BAT_1 limitations, the EPA estimated the costs of end-of-pipe biological treatment systems. To estimate the costs of the BAT_2 limitations the EPA projected costs for in-plant biological treatment systems. To project the size of the biological treatment system needed

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[249] Admin.R. 115,445, 115,447, 115,451, *reprinted in* Joint App. 5333, 5335, 5339.

[250] *Kennecott v. EPA*, 780 F.2d at 450-51.

by a particular plant the EPA utilized a "k" rate. The "k" rate, or "biokinetic constant," is one of the factors affecting a pollutant's rate of biodegradation: the lower the K rate for a pollutant the more expensive it will be to treat that pollutant.

Borg-Warner contends that the EPA erred by averaging k rates on an OCPSF industry-wide basis rather than determining the k rate for plants with phenol-dominated wastestreams. Borg-Warner argues that the k rate for phenol is substantially lower than the k rate for the industry as a whole, and therefore by averaging k rates the EPA has underestimated the costs of compliance for plants with phenol-dominated wastestreams.

The Act requires the EPA to "take into account" the costs of BAT;[251] it does not require a precise calculation. The EPA "need make only a reasonable cost estimate in setting BAT"; it is sufficient if the EPA develops " 'a rough idea of the costs the industry would incur.' "[252]

The EPA averaged k rates on an industry-wide basis because k rates varied from plant to plant depending on each plant's mix of pollutants. Most plants in the industry produce multiple pollutants and have complex wastestreams, and thus the k rate for a single pollutant will rarely accurately reflect the rate of biodegradation at a particular plant. Like any other averaging, averaging k rates might result in either an over-or under-estimate of a particular plant's actual costs.

Borg-Warner has failed to demonstrate that the EPA's cost estimates were not a reasonable approximation of the costs the industry will have to incur to meet the BAT limitations. Though Borg-Warner asserts that the EPA used an inappropriate k rate, it has failed to demonstrate

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[251] 33 U.S.C. § 1314(b)(2)(B).

[252] *NRDC v. EPA*, 863 F.2d at 1426.

how this error, if any, affected the EPA's over-all cost estimates for plants with phenol-dominated wastestreams; in other words, Borg-Warner has failed to demonstrate how much greater actual costs will be than the costs projected by EPA. Borg-Warner's claim is too vague and conclusory to serve as a basis for invalidating the limitations.

In estimating compliance costs, the EPA determined that a plant with influent phenol concentrations of 900 ppb or less could meet the BAT limitations with an end-of-pipe biological treatment system. Borg-Warner asserts that it submitted data to the EPA showing that an end-of-pipe biological treatment system would not be adequate for the Borg-Warner plant and that Borg-Warner's compliance costs would be greater than those projected by the EPA.

The EPA is required to consider costs only for a category or subcategory of plants; it is not required to determine costs on a plant-by-plant basis.[253] Thus it is irrelevant that Borg-Warner's individual compliance costs would be greater than the costs projected by the EPA.

J. The BAT_2 Limitations for Volatile Pollutants Based on Steam Stripper Technology

1. Achievability of the Limitations

The EPA designated steam stripping as the model technology for 28 volatile and semi-volatile pollutants in establishing the BAT_2 limitations. Steam stripping is a water reclamation process in which wastewater is run through a distillation column where it is injected with super-heated steam causing the volatile pollutants to vaporize and collect so that the volatile pollutants can be extracted from the water.

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[253] *E.I. du Pont de Nemours & Co. v. Train*, 430 U.S. at 128-30, 97 S.Ct. at 975-76; *BASF Wyandotte Corp. v. Costle*, 598 F.2d at 662; *American Iron & Steel Inst. v. EPA*, 526 F.2d at 1051.

PPG and Dow contend that the BAT_2 limitations are unachievable and therefore arbitrary because the data show that some of the data-base plants could not achieve the limitations. The EPA used data from PPG plant 913 and Dow plant 415 to develop the limitations for volatile pollutants including chloroform and trichloroethylene. The record indicates, however, that PPG plant 913 exceeded the monthly average for chloroform, and Dow plant 415 exceeded the daily maximum limitation for trichloroethylene on one occasion. Relying on the Fourth Circuit's decision in *Tanners' Council of America, Inc. v. Train*,[254] the petitioners argue that data showing that the data-base plants "[met] the limitations for some, but not all, of the pollution parameters" is not sufficient to demonstrate that the limitations are achievable.

The single exceedance of the daily limitation for trichloroethylene by Dow plant 415 does not make the limitation unachievable. As previously discussed, the EPA could rationally exclude extreme departures form average performance in calculating the limitations. The petitioners' own data show that Dow plant 415 had a long-term average discharge of 16.1 ppb of trichloroethylene. The EPA set the daily maximum limitation at 69 ppb. The Dow plant's single exceedance of 85 ppb is an extreme departure from average performance and the EPA could reasonably conclude that this poor performance was either an "upset" unlikely to recur or due to quality-control problems within Dow's control because on all other occasions the Dow plant was able to perform within the limitations. Thus, the industrial petitioners have failed to demonstrate that the Dow plant is incapable of meeting the BAT_2 limitations.

Second, we reject the petitioners' premise that the limitations are unachievable unless all plants in the data base

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[254] 540 F.2d at 1192-93.

have met the limitations. The legislative history of the CWA indicates that the "best available technology" refers to the single best performing plant in an industrial field.[255] The EPA urges that because the Act and the legislative history do not provide more particular guidance, it was free to determine the "best" plant on a pollutant-by-pollutant basis. The Supreme Court has stated that "[i]t is by now commonplace that 'when faced with a problem of statutory construction, this Court shows great deference to the interpretation given the statute by the officers or agency charged with its administration.' "[256] This court defers to the EPA's interpretation of the Act. The EPA's interpretation of the Act is rational and is not precluded by the legislative history.[257]

Though PPG plant 913 exceeded the monthly average limitation for chloroform, the petitioners' own data show that Dow plant 415 performed well within the limits. On at least one occasion Dow plant 415 exceeded the daily limit for trichloroethylene; however, the data show that PPG plant 913 performed within the limits. Given the EPA's interpretation of the Act, which is entitled to deference, an exceedance by one of the data-base plants is irrelevant so long as another data-base plant demonstrates that the limitations are achievable.

2. Wastestream Characteristics

PPG and Dow also assert that the EPA's limitations for volatile pollutants failed to account for the wastestream characteristics of OCPSF plants and that the wastestream matrix of these plants makes the limitations unachievable.

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[255] 1972 Leg.Hist. at 170.

[256] *EPA v. National Crushed Stone Ass'n*, 449 U.S. at 83, 101 S.Ct. at 307.

[257] *See Chevron, USA, Inc. v. NRDC*, 467 U.S. at 843-45, 104 S.Ct. at 2781-83.

The petitioners urge that the EPA should have established separate subcategories to reflect the different wastestream characteristics of different plants.

As previously discussed, the EPA determined that no further subcategorization was necessary because all BAT plants could achieve uniformly high levels of toxic removal and all plants could achieve the limitations regardless of wastestream characteristics.[258] With respect to the BAT_2 limitations for volatile pollutants, the EPA determined that steam-stripper technology is a versatile technology that can be modified to account for a particular plant's wastestream matrix.[259] The EPA therefore determined that properly-designed steam-stripper technology would make the limitations for volatile pollutants achievable for all OCPSF plants.

3. Steam-Stripper Maintenance

Steam strippers must be shut down and started again weekly for periodic cleaning and maintenance and these operations result in greater discharges of toxics. The petitioners contend that the EPA edited the high discharge readings associated with such operations from the data base. They argue that this exclusion of data representing routine maintenance is arbitrary, and by excluding such data the EPA has insured that the limits are unachievable.

The EPA considered this problem and determined that a surge tank with 24-hour detention time could be used to store wastewater during shut-down for routine maintenance; following maintenance the wastewater could be recirculated through the steam stripper without discharging the volatile pollutants into navigable waters. The EPA's decision to exclude the high discharge readings associated

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[258] Dev.Doc. IV-38-39, 41, *reprinted in* Joint App.3537-38, 3540; 52 Fed.Reg. 42,556-57.

[259] 52 Fed.Reg. 42,540-42.

with routine maintenance was therefore neither arbitrary nor capricious.

4. Dow Chemical's Plant-Specific Claims

Dow states that its chlorinated methane plant cannot meet the BAT_2 limitations for methyl chloride because of the plant's complex wastestream. Dow also states that its two Olefin plants cannot meet the limitations for benzene. Dow urges that these plants demonstrate that the limitations are unachievable; alternatively Dow urges that these plants are entitled to separate subcategories subject to different limits.

Dow's inability to meet the limitations at these plants is irrelevant because the data show that they are achievable by other plants. The EPA is not required to establish separate subcategories for single plants. Congress intended the EPA to consider individual plant characteristics that preclude compliance in an FDF variance proceeding.

K. The BAT_2 Limitations for Priority Pollutants Based on In-Plant Biological Treatment

1. Achievability of the Limitations

CMA contends that the EPA designated in-plant biological treatment "with a 24-hour detention time" and "no pre- or post-biological treatment" as the "model" technology for the BAT_2 and pretreatment limitations for twenty priority pollutants. However, the three data-base plants used to derive the limitations used end-of-pipe biological treatment systems with detention times of 17.2 days, 3.5 days, and 38 hours respectively. These three plants also had extensive pre- and post-biological treatment systems including settling tanks, equalization basins, oil separation, clarification, filtration, and neutralization systems. CMA argues that because the data-base plants used far more extensive technology than the EPA-designated "model" technology, the EPA has not demonstrated that the limitations are achievable using the model technology.

The petitioners have failed to demonstrate that end-of-pipe biological treatment systems are sufficiently different from inplant systems to make the EPA's reliance on end-of-pipe data irrational. For all we can tell from the parts of the record that have been cited, the only difference between the two systems is that they are installed at different positions in the production process.

The record indicates that the EPA designated in-plant biological treatment as the BAT_2 model technology for the treatment of priority pollutants.[260] The EPA based the BAT_2 limitations on data from three end-of-pipe biological treatment plants because these plants achieved exemplary treatment and they treated wastestreams comparable to the segregated wastestreams that would enter an in-plant treatment system.[261]

There is no indication in the record that the EPA limited the model technology to one with a "24-hour detention time" and "no pre- or post-biological treatment" as CMA asserts. In-plant biological treatment is the generic technology chosen by the EPA as a basis for the BAT_2 biological treatment limitations. In addition to inplant biological treatment, an OCPSF plant may have to install one or more additional technologies to account for the plants' wastestream characteristics. For instance, plants with wastestreams containing high concentrations of suspended solids might require settling tanks, filtration, or clarification processes.[262] Some plants may need an equalization process to reduce the variability of the raw waste load; this technology makes the waste more uniform and makes treatment more efficient.[263] Others may need to neutralize their wastestreams to adjust either an acidic or

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[260] 52 Fed.Reg. 42,532, 42,538, and 42,548.

[261] Dev.Doc. VII-49, *reprinted in* Joint App. 3749.

[262] Dev.Doc. VII-44, 58, *reprinted in* Joint App. 3758.

[263] Dev.Doc. VII-51-52, *reprinted in* Joint App. 3751-52.

a base wastestream to facilitate effective biological treatment.[264] Plants that have wastestreams containing oil or grease may need an oil separation system.[265]

The Act requires the EPA to establish effluent limits "for a category or class of point sources."[266] It does not require the EPA to identify the specific technologies that a particular plant must install to meet the limitations.

2. The EPA's Estimate of the Costs of Complying with the Limitations

To determine the costs of in-plant biological treatment systems the EPA used a computer costing model developed by the U.S. Army Corps of Engineers called "CAPDET." The CAPDET model generates capital, operation, and maintenance costs for a biological treatment system based on the characteristics of a particular system. For plants with wastestreams of less than 0.5 million gallons per day (MGD), the CAPDET model provided cost estimates for an "extended aeration activated sludge" treatment system consisting of an equalization tank, an aeration tank, secondary clarification, and a control system.[267] This system requires a detention time of 18 to 36 hours.[268] For plants with wastestreams greater than 0.5 MGD, the CAPDET model estimated the cost of the larger "completely mixed activated sludge" treatment process;[269] this system requires a detention time of 50.6 hours.[270]

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[264] Dev.Doc. VII-55, *reprinted in* Joint App. 3755.

[265] Dev.Doc. VII-56-57, *reprinted in* Joint App. 3756-57.

[266] 33 U.S.C. § 1311(b)(2)(A).

[267] Admin.R. 072445, 093886-906, CAPDET Manual at 3.1-1, *reprinted in* Joint App. 246, 4965-85, 4659.

[268] CAPDET Manual 3.1-2, *reprinted in* Joint App. 4660.

[269] Dev.Doc. VII-63 and VIII-40, *reprinted in* Joint App. 3763, 3993.

[270] Admin.R. 93970-4020, *reprinted in* Joint App. 4995-5044.

As CMA notes, the detention times for two of the database plants were greater than the longest detention time used to calculate the costs of biological treatment systems. CMA argues that this error makes the limitations unachievable. The EPA's error, however, if any, would affect the accuracy of its cost projections and not the achievability of the limitations.

Though the detention times of two of the plants used to derive the limitations were substantially longer than the detention times projected for the costed technology, the EPA determined that the other factors in a biological treatment system could be modified to achieve a particular level of pollutant removal. These factors include organic loading in the influent, the concentration of biodegrading organisms in the aeration basin, and the length of time those organisms remain in the aeration basin.[271] The EPA has demonstrated that the technology used to estimate costs is a reasonable approximation of the type and cost of technology that must be used to meet the limitations.

3. Land Costs

The pretreatment standards for the priority pollutants, which are based on the BAT_2 limitations, apply to indirect dischargers who are typically located in urban areas where land is scarce and expensive. In-plant biological treatment systems require additional land for the large primary treatment, equalization, and aeration tanks that are part of the system. CMA argues that the pretreatment standards are arbitrary because the EPA failed to consider the land costs associated with in-plant biological treatment.

The record shows that the EPA considered the land costs necessary for in-plant biological treatment systems.[272] The EPA determined that the costs of the pretreatment

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[271] Dev.Doc.VII-62, *reprinted in* Joint App. 3762.

[272] Dev.Doc. VIII-187-96, *reprinted in* Joint App. 4140-49.

standards was warranted, despite substantial economic dislocations, because the standards would prevent the discharge of substantial amounts of toxic pollutants into navigable waters.[273] The EPA considered the costs of the pretreatments standards, including land costs, and determined that these costs were reasonable; this was all that was required under the Act.

L. Compliance Deadline

1. Lack of Sufficient Lead Time for Industry Members to Comply

The Water Quality Act (WQA) Amendments of 1987 directed the EPA to promulgate BAT limitations by December 31, 1986.[274] The WQA Amendments also established March 31, 1989, as the final compliance date for the OCPSF BAT limitations.[275] The EPA promulgated the OCPSF limitations on November 5, 1987. Borg-Warner argues that Congress intended industry to have at least three years lead time before it would be subject to the limitations and that the EPA's failure to promulgate regulations with sufficient lead time for compliance constitutes a denial of due process.

We first look to Congressional intent. Because the BAT limitations had not been promulgated on February 4, 1987, the date Congress passed the 1987 WQA Amendments, Congress obviously understood that substantially less than three years would elapse before the compliance date. The Act and its legislative history reflect non-compliance due to the Administrator's failure to promulgate regulations by the prescribed date would be accommodated by the EPA's post-deadline enforcement policy.[276]

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[273] 52 Fed.Reg. 42,548-49.

[274] Water Quality Act of 1987, P.L. 100-4, § 301(f) (1987).

[275] 33 U.S.C. § 1311(b)(2)(C).

[276] *See* 33 U.S.C. §§ 1319(a)(3) and 1319(a)(5)(A).

The Act, thus interpreted, does not deny industry members due process. Section 309 of the Act provides that, if a discharger fails to comply with a "final deadline," the Administrator shall schedule a "reasonable" time for compliance "taking into account the seriousness of the violation and any good-faith efforts to comply with applicable requirements."[277] The Conference Report accompanying the WQA Amendments further explains:

> With respect to the establishment of an outside date of March 31, 1989, for compliance with technology based requirements, the conferees note that prompt promulgation of the relevant effluent limitations will be essential to allow dischargers sufficient time to come into compliance. Therefore, the conferees direct that the Administrator promulgate such limitations as expeditiously as possible.
>
> If dischargers in an entire category are unable to meet the March 31, 1989, deadline provided in the conference substitute as a result of the Administrator's failure to promulgate effluent limitations in sufficient time to allow for compliance by such date, *noncompliance resulting from the Administrator's delay can be dealt with under EPA's current post-1984 deadline enforcement policy.* That policy calls for the Agency, at the same time a permit containing the statutory deadline is issued, to *issue an administrative order to the non-complying company which specifies a schedule of compliance as expeditiously as practicable, but not later than three years after permit issuance.*[278]

Through section 309 Congress has adequately dealt with the dilemma that may confront an industry member due

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[277] 33 U.S.C. § 1319(a)(3)(A).

[278] H.R.Conf.Rep. No. 1004, 99th Cong., 2d Sess. 115 (1986) (emphasis added).

to the Administrator's delay in promulgating the limitations.[279]

Borg-Warner argues that reliance on the EPA's prosecutorial discretion is not an adequate remedy for the Administrator's delay in promulgating the regulations because of the risk of selective enforcement. This argument presumes that the EPA will act in bad faith and contrary to congressional intent. If that should occur, an industrial petitioner's remedy is to seek judicial review of the EPA's illegal actions or to invoke that illegality as a defense to an enforcement action.

2. Availability of BAT Technology

Borg-Warner asserts that at least three years lead time is necessary for the installation of BAT technology and many plants in the industry will not be able to install the technology in time for the compliance deadline. Borg-Warner argues that without sufficient lead time the technology needed to satisfy the BAT limitations is not "available" within the meaning of the Act.

This argument is based on a misreading of the Act. The Act directs the EPA to establish effluent limitations "which shall require application of the best available technology economically achievable for such category or class."[280] It requires that the effluent limitations be based on "available" model technology; it does not require the EPA to consider the temporal availability of the model technology to individual plants.[281] Section 304(b)(2)(B) of the Act[282] lists those factors the EPA should consider in identifying the

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[279] *Consolidation Coal Co. v. Costle*, 604 F.2d 239, 245-46 (4th Cir.1979), *rev'd in part on different ground sub. nom. EPA v. National Crushed Stone Ass'n*, 449 U.S. 64, 101 S.Ct. 295, 66 L.Ed.2d 268 (1980).

[280] 33 U.S.C. § 1311(b)(2)(A).

[281] *American Meat Inst. v. EPA*, 526 F.2d at 451.

[282] 33 U.S.C. § 1314(b)(2)(B).

BAT model technology; these factors do not include consideration of an individual plant's lead time. Moreover, as previously discussed, Congress separately provided an exception under Section 309 for plants without sufficient lead time to comply with the regulations. This exception would be redundant if Congress intended the EPA to consider lead time in determining whether technology is "available."

IV. *Pretreatment Standards for Existing Sources (PSES) Issues*

A. "Pass Through" Issues

1. The EPA's Definition of "Pass Through"

In addition to authorizing the EPA to regulate the discharge of pollutants directly into the nation's waters, the CWA authorizes the EPA to establish pretreatment standards for "indirect discharges"—industrial dischargers who release wastes into publicly-owned treatment works (POTWs) rather than directly into navigable waters.

Congress "recognized that the pollutants which some indirect dischargers release into POTWs could interfere with the operation of the POTWs, or could pass through the POTWs without adequate treatment."[283] Accordingly, the Act authorizes the EPA to identify those pollutants which "pass through" POTWs without adequate treatment, or which "interfere with" the operation of POTWs, and to promulgate pretreatment standards which require indirect dischargers to reduce the levels of such pollutants before they are released into public sewage systems.

The Act provides:

> The Administrator shall, within one hundred and eighty days after October 18, 1972, and from time to

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[283] *National Ass'n of Metal Finishers v. EPA*, 719 F.2d at 633.

> time thereafter, publish proposed regulations establishing pretreatment standards for introduction of pollutants into treatment works . . . which are publicly owned for those pollutants which are determined not to be susceptible to treatment by such treatment works or which would interfere with the operation of such treatment works. . . . Pretreatment standards under this subsection shall specify a time for compliance not to exceed three years from the date of promulgation and shall be established to prevent the discharge of any pollutant through treatment works . . . which pollutant interferes with, passes through, or otherwise is incompatible with such works.[284]

In 1977, when Congress amended the CWA to strengthen the provisions for controlling toxic pollutants, Congress provided that "an indirect discharger . . . had to 'pretreat' its waste waters so as to achieve, together with the [POTW] that treated the waste before final discharge into navigable waters, the same level of toxics removal as was required of a direct discharger."[285]

Pursuant to this statutory mandate, the EPA has developed pretreatment standards for specific categories of dischargers that limit the types and amounts of pollutants which may be discharged to POTWs by facilities in each industrial category. These categorical pretreatment standards are technology-based and are analogous to the BAT effluent-limitation guidelines for the removal of toxic-pollutants—that is, they are intended to represent the best available technology that is economically achievable by indirect dischargers.[286] In order to determine when a pollutant "passes through" a POTW and should therefore be

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[284] 33 U.S.C. § 1317(b)(1).

[285] *NRDC v. EPA*, 790 F.2d 289, 292 (3rd Cir.1986).

[286] *See, e.g.*, H.R.Rep. No. 830, U.S.Code Cong. & Admin.News 1977, p. 4326, *reprinted in* 1977 Leg.Hist. at 271, 342, 403.

subject to pretreatment, the EPA has adopted a "BAT comparison" approach. A pollutant is deemed to "pass through" for purposes of the categorical pretreatment standards "if the nation-wide average percentage of the pollutant removed by well-operated POTWs achieving secondary treatment is less than the percent removed by the BAT model treatment system."[287]

CMA asserts that the PSES that the EPA has promulgated for the OCPSF industry are arbitrary and capricious because EPA's "BAT comparison" approach for identifying pollutants that "pass through" POTWs and are thus subject to pretreatment regulations does not take into account the actual performance of particular POTWs and therefore requires redundant treatment. Consequently, CMA claims, the PSES lead to "absurd results."

Specifically, CMA argues that the EPA has established pretreatment standards for some pollutants which are already receiving exemplary treatment by POTWs across the country and that it has furthermore established pretreatment standards for some pollutants which cannot even be detected in the effluent of POTWs by present analytical methods. With respect to this last group of pollutants, CMA contends that the EPA has unlawfully *assumed* pass through, without any evidence that the POTW is actually achieving less effective removal than a direct discharger complying with the BAT standards.

The statute itself simply directs the EPA to promulgate pretreatment standards for pollutants "which are determined" to pass through and does not specify a method by which the EPA is required to make that determination.[288] "Where a statute is silent with respect to the precise question at issue, the question for the reviewing court is whether the agency's interpretation is based on a permis-

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[287] 52 Fed.Reg. 42,525.

[288] 33 U.S.C. § 1317(b)(1).

sible construction of the statute."[289] As the EPA interprets the statute, the Agency is not required to assume that no pass through takes place in the absence of full-scale data to the contrary.[290] Because we find the EPA's interpretation of the statute to be reasonable and consistent with Congress' intent, we decline to invalidate the OCPSF PSES on the grounds proposed by CMA.[291]

In adopting the "BAT comparison" approach to defining "pass through," the EPA explained that it sought to satisfy two competing congressional objectives:

> That standards for indirect dischargers be equivalent to standards for direct dischargers, and that the treatment capability and performance of the POTW be recognized and taken into account in regulating the discharge of pollutants from indirect dischargers.[292]

The EPA explained that it had determined, after considering alternative methods, that its approach of comparing average percent removal rates to determine pass through was the best solution to the inherent difficulty of measuring the effectiveness of POTWs' treatment of toxic pollutants. The difficulty stems from the fact that the concentration of toxic pollutants in POTWs' influent is much lower than that in industry treatment systems because the

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[289] *Diamond Shamrock Exploration Corp. v. Hodel*, 853 F.2d 1159, 1165 (5th Cir,1988); *Chevron, USA, Inc. v. NRDC*, 467 U.S. at 843, 104 S.Ct. at 2782 (reviewing court may not simply impose its own construction on the statute); *American Iron & Steel Inst. v. EPA*, 526 F.2d at 1041 (where statutes susceptible of competing interpretations, and EPA's interpretation is reasonable, court must defer to that interpretation).

[290] 52 Fed.Reg. 42,547.

[291] *NRDC v. Thomas*, 805 F.2d 410, 420 (D.C. Cir.1986) (EPA's interpretation of statute it is charged with administering should be reversed only if contrary to clear congressional mandate or an unreasonable construction of that mandate).

[292] 48 Fed.Reg. 11,841.

industrial dischargers' wastewater mixes in the POTW system with wastewater from other sources that does not contain toxic pollutants. As a result of this dilution, the POTWs' influent concentrations of toxics may already be nearly undetectable by present methods—even though the mass of toxic pollutants has not been reduced. The concentration of toxic pollutants in effluent may therefore be undetected, even if the POTWs' treatment is not, in actuality, very effective in reducing the mass of toxic pollutants.

The EPA explained that it had rejected the alternatives of direct comparison of effluent concentrations[293] and a percent differential approach[294] to measuring pass through

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[293] The EPA determined that a comparison between the effluent concentrations of POTWs and industrial facilities was inappropriate due to two major factors: (1) the unique problems posed by the dilution that results from commingling industrial with non-industrial wastewater within POTWs; and (2) the more complicated nature of the POTWs' effluent, resulting from contributions from various industries. These factors were found likely to render the POTW effluent-pollutant concentration lower than that for direct dischargers—even if the pollutant's mass exceeded the amount allowed for any single direct discharger. 46 Fed.Reg. at 9415-16.

[294] The EPA considered, but ultimately rejected, the "percent differential approach" to calculating "pass through." The percent differential approach would have found "pass through" only when the average percent removed by a direct discharger using BAT exceeded POTW removals by a specified percent. This approach is based on the assumption that a removal difference of less than a certain percent may not reflect differences in treatment efficiency, but may reflect only analytical variability of low concentrations typically found in end-of-pipe biological systems. *See* 48 Fed.Reg. 11,841-42 (EPA proposed five percent differential in 1983); 51 Fed.Reg. 44,090 (EPA proposed in 1985 to increase five percent differential to ten percent, but ultimately decided to adhere to present approach of comparing average percent removal rates). The Agency explained that the percent differential approach was unsatisfactory because it was difficult, using that method, to determine whether levels substantially below the analytical detection limit result from POTW treatment or from mere dilution, since the

because both approaches tended to overestimate the effectiveness of POTW treatment and therefore created an unacceptable risk that toxic pollutants were in fact passing through POTWs.[295]

The EPA concluded that the approach of comparing average percent removal rates "is unbiased in that it does not favor either overregulation or underregulation in determining which pollutants are regulated at PSES."[296] CMA objects that if the EPA applied this direct comparison, it would find pass through, and therefore impose pretreatment standards, even if POTWs achieved a 96.2% removal rate for a particular toxic pollutant, so long as the EPA predicts that plants complying with BAT can achieve slightly greater removal—even 96.3%.

Given the EPA's well-founded concern that the effects of dilution may cause the effectiveness of POTW treatment to be overstated, we cannot conclude that the EPA's method of determining pass through is arbitrary. As we have stated, "At first blush, it may be unclear why dilution can be a problem. One might believe that the proper goal of a treatment system is to produce water 'so clean' that pollutants are present in only immeasurably small amounts. This is usually, but not always the case. Certain pollutants are dangerous even in immeasurably small concentrations."[297]

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data were derived from samples demonstrating pollutants at or below the detection limits. 5 Fed.Reg. 42,545.

[296] EPA concluded that to allow even a few pollutants to go unregulated based on a percent differential could have significant consequences in terms of the number of pounds of unregulated toxic pollutants discharged. Dev.Doc. VI-32, *reprinted in* Joint App. at 3688.

[295] 52 Fed.Reg. 42,545.

[297] *Texas Municipal Power Agency v. EPA*, 836 F.2d at 1489 n. 38; *see also Weyerhaeuser Co. v. Costle*, 590 F.2d at 1041; *National Ass'n of Metal Finishers v. EPA*, 719 F.2d at 651 n. 38; *Cerro Copper Products v. Ruckelshaus*, 766 F.2d at 1069.

CMA also maintains that the EPA arbitrarily assumed that certain pollutants that were not detected in POTW effluent were present at the minimum analytical level. Because the minimum analytical level is then used to calculate removal, CMA asserts that some pollutants may be subject to PSES even if the POTWs' actual percent removal is higher than the BAT percent removal of the same pollutant.

The EPA has explained, however, that its practice of assigning the minimum analytic value to certain pollutants that did not appear at detectable levels in POTW effluent is also designed to compensate for the effects of dilution. The Agency explained:

> The conservative approach of adopting the 'detection' limit or the analytical threshold as the effluent value for such measurements has the effect of underestimating the POTW's percent removal. . . . In many cases, in fact, both POTW and BAT treatment systems with relatively [low] influent concentrations yielded effluent measurements below detection, and the resulting percent removals were not true measures of treatment effectiveness, but rather were functions of influent concentrations. . . . The POTW might be achieving as high a percent removal as the BAT level technology, but there was no basis for determining whether this was so or not.[298]

The EPA reasonably concluded that due to the effects of dilution on influent concentrations, the "non-detects" or "ND" values (indicating effluent concentrations too low to measure) derived from POTWs with low influent concentrations of priority toxic pollutants did not necessarily demonstrate that the pollutants had been effectively treated and removed from the effluent.[299]

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[298] 52 Fed.Reg. 42,546.

[299] 52 Fed.Reg. 42,545-46.

We hold that the EPA reasonably adopted the conservative methodology of assigning the minimum analytical value to certain pollutants that yielded "ND" values in effluent concentrations in order to account for the possibility that, because of the effects of dilution on influent concentrations, priority toxics are present in POTW effluent at levels far greater than can presently be measured. We further note that the EPA has taken reasonable steps to reduce the likelihood of underestimating the effectiveness of POTW removals.[300]

2. The EPA's Methodology in Assuming an Absence of "Pass Through" Based on POTW Averages

NRDC argues that the EPA's pass-through methodology in practice tends to overestimate the amount of toxic pollutants removed by POTWs. Originally, the EPA had proposed to find pass through whenever it had insufficient POTW data to make a comparison with BAT removal; this

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[300] The EPA explained that in selecting appropriate data for the "pass through" comparison, it deleted very low influent data from its analysis and used data from POTWs only if their influent level was at least ten times the analytical minimum level or at least 100 ug/l. This editing criterion, which was also used to select data for establishing BAT limitations, assesses more accurately the POTWs' removal rate. The EPA explained that when influent concentration is below this level, effluent concentrations below the pollutants' analytical threshold often may be achieved using less than BAT level treatment. This "editing criterion helps to insure that BAT effluent limitations generally reflect the technical capability of BAT level treatment rather than low influent concentrations.' 52 Fed.Reg. 42,546.

More than half (24) of the pollutants subject to PSES were identified based on this editing criterion. For the remainder (16), influent data above the "ten times the detection limit" are unavailable due to POTW dilution. For these pollutants, EPA relied instead on data procured after using a 20 ug/l cutoff for POTW influent concentrations—the standard originally used to calculate pass through in the Agency's 1983 proposal. *Id.*

position was supported by NRDC. The EPA then revised its position and decided to assume an absence of pass through for three toxic pollutants—bis(2 chloroisopropyl)ether, acrylonitrile, and 3, 4 benzofluoroanthene—on the basis of POTW removal averages. NRDC argues that the EPA's new position is inconsistent with § 307(b)(1) of the Clean Water Act, which reads: "Pretreatment standards . . . shall be established to prevent the discharge of any pollutant through treatment works . . . which are publicly owned, which pollutant interferes with, passes through, or otherwise is incompatible with such works."[301] NRDC further alleges that the EPA committed analytical errors in its calculation of average POTW removal. The EPA decided to calculate the overall average of BAT and POTW removal rates rather than average daily rates. This, NRDC alleges, tends to merge spike concentrations of individual pollutants into the base flow and thus determines a plant's average removal, rather than a plant's consistent, daily removal capability.

The EPA responds to NRDC's argument that determining the average POTW removal rate for purposes of determining pass through is inconsistent with the Clean Water Act by correctly noting that its regulations meet Congress' mandate that the EPA establish pretreatment standards for pollutants which pass through. Since Congress provided no criteria by which the EPA is to determine when a pollutant "passes through" a POTW untreated, the establishment of pass-through criteria is left to the Administrator's discretion. In reviewing the Administrator's interpretation of the phrase "pass through," we must accord the Administrator a presumption of regularity.[302] While we must "reject administrative construc-

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[301] 33 U.S.C. § 1317(b)(1).

[302] *Citizens to Preserve Overton Park*, 401 U.S. at 405, 91 S.Ct. at 818; *NRDC v. EPA*, 790 F.2d 289, 197 (3d Cir.1986).

tions that are contrary to clear congressional intent,"[303] we must nonetheless accord the EPA deference if it is within the limits of its authority to interpret that statute.[304]

The EPA has chosen to define pass through by reference to the average amount of toxic pollutants removed by the POTW. NRDC would rather have the EPA determine pass through on a daily consistent basis. We hold that the EPA's decision to define pass through based on POTW average removal does not violate the CWA. Due to the fact that industrial waste entering a POTW is mixed with other municipal wastes, such as sewage, it is impossible to trace a given influent stream through the POTW. It would therefore be impossible for the EPA to accurately determine what percentage of waste a POTW was removing on a daily basis, since this requires a direct comparison of influent concentration to effluent concentration.[305] As a result of this analytical difficulty, the EPA has chosen the reasonable and available step of evaluating POTW performance on an average basis. Given the factual situation and analytical uncertainty in this area, we find this to be an acceptable interpretation of § 307(b)(1) of the CWA.

3. The EPA's Decision Not to Find Pass Through Based on Sludge Contamination

The EPA determined that chromium, copper, and nickel do not pass through POTWs, and therefore the EPA did not promulgate pretreatment standards for these metals. NRDC contends that these metals contaminate the sludge, which is not treated by wastewater technologies, and that

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[303] *Chevron, USA, Inc. v. NRDC*, 467 U.S. at 843 n. 9, 104 S.Ct. at 2781 n. 9.

[304] *International Brotherhood of Teamsters v. Daniel*, 439 U.S. 552, 566, 99 S.Ct. 790, 799, 56 L.Ed.2d 808 (1979).

[305] *See* 52 Fed.Reg. 42,546.

sludge contamination was not considered by the EPA. The result of this, NRDC argues, is that the EPA's calculations tend to overestimate POTW removal effectiveness because pollutants transferred to sludge are counted as removed from the wastewater when, in effect, they are merely transferred to a different medium, in this case, sludge. NRDC therefore requests this court to order the EPA to develop pretreatment standards for these three pollutants. The EPA responds, first, that neither NRDC nor any other petitioner commented on this issue. While this does not necessarily bar NRDC from challenging the rule now, we will nonetheless accord NRDC less latitude in their argument.[306]

EPA notes, secondly, that it plans to regulate sludge separately from wastewater, so presumably the problem of these three pollutants will be addressed in the forthcoming sludge regulations, which are now in the developmental process. Congress' intent was that the present of pollutants in sludge would be regulated under § 405(d).[307] As further evidence of Congress' intent, in 1977 Congress rejected a proposed amendment which would have required the EPA to regulate pollutants which contaminate the sludge of POTWs.[308] Therefore, we hold that the EPA acted in accordance with its statutory mandate when it decided not to find pass through of chromium, copper and nickel, which contaminate sludge, since sludge will be the subject of future regulations.

B. The EPA's Decision Not to Regulate Six Volatile Organic Pollutants on the Basis of Interference with POTW Worker Safety

NRDC argues that EPA's decision not to regulate six toxic pollutants violated the Clean Water Act. Specifically,

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[306] *See Reynolds Metals Co. v. EPA*, 760 F.2d at 563.

[307] 33 U.S.C. § 1345(d); *see also* 1977 Leg.Hist. at 270-72. (In establishing pretreatment standards EPA shall consider § 405 guidelines).

[308] *See* Dev.Doc. VI-38, *reprinted in* Joint App. 3694.

the EPA declined to find pass through, and therefore did not establish pretreatment standards for, six pollutants which, according to NRDC, volatilize or evaporate into the air. If a pollutant volatilizes, pollution is transferred from one medium to another—in this case, from water to air. NRDC stresses that the EPA must determine that a pollutant is physically degraded or treated in order to find that it has been removed.

The EPA responds to NRDC's challenge by noting that three of the six pollutants not regulated—2, 4 dinitrophenol, benzo(k)fluoroanthene, and acenaphthylene—would be sufficiently treated by in-plant controls on the same wastestream for other toxic pollutants that have been determined to pass through.[309] This is due to the fact that these three compounds are structurally similar to the other compounds for which PSES are established, thus ensuring sufficient control.[310] We find this reasoning to be rational and therefore uphold the EPA's judgment in this regard.

The EPA's decision to reserve three other pollutants—acrylonitrile, bis(2-chloroisopropyl)ether, and benzo(b)fluoroanthene—was based on the fact that they do not volatilize extensively and that EPA lacks POTW removal data.[311] The EPA points to the record which indicates that benzo(b)fluoroanthene does not volatilize.[312]

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[309] *See* Dev.Doc. VI-38, *reprinted in* Joint App. 3694.

[310] *See* Dev.Doc. Table VI-14, VI-41; Dev.Doc. VIII-276, *reprinted in* Joint App. 3697.

[311] Bis(2-chloroisopropyl)ether has been voluntarily remanded to EPA for further consideration; therefore, NRDC's challenge on the pollutant is moot.

[312] *See* Table VIII-19, Dev.Doc. at VIII-277-8, *reprinted in* Joint App. 4225-26. Benzo(b)fluoroanthene has a low Henry's Law constant. A compound's potential for volatilization is related to its vapor pressure solubility in solution, the principal measure of which is Henry's Law constant. The higher a substance's Henry's Law constant, the more likely that compound is to migrate from water to air. Dev.Doc. VIII-275, *reprinted in* Joint App. 4223.

Acrylonitrile volatilized at the low rate of approximately five percent.[313] This is compared to a volatilization rate of 80-95% for the pollutants that were regulated by the EPA on the basis of volatilization.[314] Thus, we are persuaded that the EPA's decision to reserve acrylonitrile and benzo(b)fluoroanthene was reasonable due to the low amounts of volatilization that actually occur.

NRDC finally argues that the EPA should have regulated additional pollutants because certain volatile toxic pollutants interfere with POTW worker safety. NRDC does not, however, direct us to any portions of the record which adequately support this contention. The EPA solicited comments regarding the regulation of volatile organics on the basis of interference with worker safety, but ultimately rejected this option due to a lack of record support.[315] Though NRDC did, in 1985, comment generally regarding the problems that volatile organics may cause in POTW sewers, it never provided the EPA with documented support for a finding of interference based on worker safety.[316] Due to the lack of any evidence confirming NRDC's assertion of dangers posed to workers' safety, we must uphold the EPA's decision not to regulate on this basis.

C. Application of PSES to Small Plants

The Synthetic Organic Chemicals Manufacturers Association (SOCMA) claims that the pretreatment standards are arbitrary and unlawful as applied to small indirect-discharging plants or those which produce less than 15 million pounds of OCPSF products annually. SOCMA argues first, that PSES will have a disproportionately severe impact on small plants as compared to large plants and

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[313] *Id.*

[314] 52 Fed.Reg. 42,547.

[315] *Id.*

[316] *See* 1985 NRDC comments at 58-59, *reprinted in* Joint App. 1998-99.

that, absent the creation of a subcategory for such plants, the EPA has failed to meet the requirement that PSES be economically achievable. Second, SOCMA maintains that the EPA's analysis of the economic impact on small plants is invalid because the EPA improperly relied on vendor-supplied package biological plants as a model technology. Finally, SOCMA argues that in refusing to create a subcategory for small plants, the EPA improperly failed to consider that only a few plants and a few pollutants account for most discharges by small plants. SOCMA maintains that the EPA should have exempted small plants from the PSES or established less stringent standards for such plants.

The EPA responds that the economic impact of PSES on small direct dischargers is not so severe and disproportionate as to warrant the creation of a special subcategory subject to less stringent regulations. The EPA emphasizes that indirect dischargers have not been subject to national regulations over the past fifteen years, and that many have not employed any treatment at all. EPA concludes that small dischargers cannot be exempted from PSES or subject to relaxed standards without allowing large quantities of pollutants to go, unregulated, into public sewage systems.

1. Economic Impact of PSES on Small Dischargers

As noted above, PSES are equivalent to BAT standards.[317] Accordingly, PSES are to be set in accordance with the directives of Section 304(b)(2)(B), which dictates that the EPA:

> take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control

[317] 1977 Leg.Hist. at 342, 403.

> techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impact (including energy requirements), and such other factors as the administrator deems appropriate.[318]

Congress did not specify a particular method of evaluating the costs of compliance with BAT or specify how those costs should be considered in relation to other factors, but simply directed the Agency to consider whether the costs associated with pollutant reduction are "economically unachievable."[319] Both Congress and the Supreme Court have made clear that in setting BAT, the EPA is not required to compare the costs against the benefits of pollution reduction in the same manner as the EPA is required to do in setting BPT standards.[320]

Because standards based on BAT, like BAT itself, reflect the intention of Congress to push industries toward the goal of eliminating the discharge of pollutants as quickly as possible, this goal is factored into determina-

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[318] 33 U.S.C. § 1314(b)(2)(B).

[319] 33 U.S.C. § 1311(b)(2)(A).

[320] *EPA v. National Crushed Stone Ass'n*, 449 U.S. at 71 n. 10, 101 S.Ct. at 300 n. 10 (Section 304(b)(2)(B), unlike Section 301(b)(1)(B) which governs BPT standards, "does not state that costs shall be considered in relation to effluent reduction"); *American Iron & Steel Inst. v. EPA*, 526 F.2d at 1051-52; *see also Association of Pacific Fisheries v. EPA*, 615 F.2d at 818 ("Congress did not intend the Agency or this court to engage in marginal cost-benefit comparisons").

The 1972 conference report confirms that while costs should be a factor in the Administrator's judgment, no balancing test is required:

> The Administrator will be bound by a test of reasonableness. In this case, the reasonableness of what is "economically achievable" should reflect an evaluation of what needs to be done to move toward the elimination of the discharge of pollutants and what is achievable through the application of available technology—without regard to cost.

1972 Leg.Hist. at 170.

tions of the reasonableness of the costs associated with the regulation.[321] As long as the required technology reduces the discharge of pollutants, a court's "inquiry will be limited to whether the Agency considered the cost of technology, along with the other statutory factors, and whether its conclusion is reasonable."[322]

In evaluating the costs associated with PSES compliance, the EPA performed a detailed cost assessment[323] and found that the projected capital and annualized costs associated with compliance with PSES for the OCPSF industry as a whole would be $291,500,000 and $204,300,000, respectively.[324] The EPA did not find these costs so significant as to render the PSES economically unachievable.[325]

In assessing the economic effects of the PSES, the EPA also evaluated the plant closures, associated job losses, and other significant impacts that may result from compliance with PSES. The EPA estimated that compliance with the PSES would force 14% of all indirect discharging plants to close and cause a 1.2% reduction in total industry employment. The EPA evaluated these estimates as follows:

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[321] *Association of Pacific Fisheries*, 615 F.2d at 818; *see also Kennecott v. EPA*, 780 F.2d at 448.

[322] *Association of Pacific Fisheries*, 615 F.2d at 818. While costs are to be considered on a class or category basis, as opposed to a plant-by-plant basis, costs of compliance are not to be given primary importance. *American Iron & Steel Inst. v. EPA*, 526 F.2d at 1051; *accord FMC Corp v. Train*, 539 F.2d at 979 (the EPA's duty to consider costs "should not serve as a dilatory device, obstructing the Agency from proceeding with its primary mission of cleaning up the lakes, rivers, and streams of this Nation").

[323] Dev.Doc.App. VIII-B-38-52, *reprinted in* Joint App. at 4570-84 (EPA compiled a plant-by-plant compliance cost estimate for PSES).

[324] 52 Fed.Reg. 42,548, 42,551.

[325] 52 Fed.Reg. 42,548.

> While these impacts are significant, the Agency does not believe they constitute economic unachievability for the indirect discharging segment of the OCPSF industry. Eighty-six percent of the indirect discharger segment of the industry will not suffer either plant or product line closures, and 69 percent of the indirect discharging plants will not be significantly impacted under any measure. A very large number of pounds of toxic pollutants (22.5 million pounds) from discharges to POTWs will be removed by PSES. EPA has therefore concluded that promulgation of PSES as described above is therefore warranted with respect to OCPSF indirect dischargers.[326]

SOCMA claims, however, that the costs of PSES fall disproportionately on plants producing less than or equal to 15 million pounds of OCPSF product annually. Specifically, SOCMA maintains that plants of this size produce only 1.37% of the OCPSF products produced by all OCPSF dischargers, but will bear 35% of the capital costs. Moreover, SOCMA notes, the proportion of small plants that will be severely impacted by PSES is 50%, compared to 14% for those plants producing more than 15 million pounds of OCPSF product. SOCMA concludes that the PSES are economically unachievable for plants under the 15 million pound production level, and that the EPA's failure to create a subcategory for these plants thus renders PSES arbitrary as applied to this group.

Our role in reviewing the EPA's decision is not to undertake our own economic study, but to determine whether the EPA "has established in the record a reasonable basis for its decision."[327] We find that the EPA has done so. Specifically, the EPA compared the projected plant closures and associated job losses for groups of plants ca-

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[326] *Id.*

[327] *Kenniecott v. EPA*, 780 F.2d at 456.

tegorized according to the amount of OCPSF production manufactured annually. The EPA analyzed the impacts on plants producing less than 15 million pounds of OCPSF goods annually and further compared subsets within that larger group. The EPA found that plants producing less than 5 million pounds of OCPSF products annually are not impacted significantly more than plants producing less than 10 or 15 million pounds annually and thus do not warrant recognition as a distinct class of plants.[328] Of the 106 plants producing less than 5 million pounds annually, 27 or approximately 26% of those plants were projected to close, resulting in a loss of 800 jobs.[329]

The EPA explained that it focused on those plants under the 5-million-pound cutoff because it found that the 10- and 15-million-pound cutoffs did not capture impact as accurately as the 5-million-pound cutoff. While both groups included approximately the same percentage of significantly affected plants, the EPA determined that there are 22 more plants under the 10-million-pound cutoff and 47 more plants under the 15-million-pound cutoff that are not significantly affected. The EPA concluded that any relief for plants of this size would be inappropriate because of the number of unaffected plants, and because the amount of pollutant discharged by plants under the 10- or 15-million-pound production cutoffs is far greater than that discharged by plants under the 5-million-pound cutoff.[330] The EPA concluded that the closure rates for these three subgroups under 15 million pounds of production annually (under 5 million, 5 to 10 million, and 10 to 15 million pounds)—approximately 25%, 20%, and 12%, respectively—

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[328] 52 Fed.Reg. 42,548.

[329] EPA, Regulatory Flexibility Analysis for Effluent Guidelines and Standards for the Organic Chemicals, Plastics and Synthetic Fibers Industry, Sep. 25, 1987, p. 8, *reprinted in* Joint App. at 5930.

[330] EPA, Regulatory Flexibility, Analysis, p. 9, *reprinted in* Joint App. at 5931.

are close enough to warrant similar treatment and that none of these three groups alone exhibited an impact so severe as to warrant an exemption.[331] The EPA found that the alternative of granting an exemption for all indirect dischargers under the 15-million-pound cutoff would exempt from PSES almost 70 percent of all indirect dischargers that are not significantly affected and would forego the removal of 5.42 million pounds of toxic pollutants annually.[332]

While we agree that PSES will have a serious economic impact on OCPSF indirect dischargers under the 15-million-pound production level, we conclude that the EPA has provided a sufficient record basis for its decision not to create a subcategory for these plants. Accordingly, we cannot conclude that the EPA's decision was arbitrary.[333]

We must view the EPA's decision in the light of Congress' intent regarding the role of economic factors in setting water quality standards. Congress clearly understood that achieving the CWA's goal of eliminating all discharges[334] would cause "some disruption in our economy," including plant closures and job losses.[335] Moreover, Congress was aware that the economic impact of environmental regulations would be most severe for small plants.[336]

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[331] 1985 Responses to Public Comments, Issue IV.A.1, *reprinted in* Joint App. at 5931.

[332] 52 Fed.Reg. 42,548.

[333] *Kennecott v. EPA*, 780 F.2d at 456.

[334] 33 U.S.C. § 1251.

[335] *EPA v. National Crushed Stone Ass'n*, 449 U.S. at 80, 101 S.Ct. at 305; *American Iron & Steel Inst. v. EPA*, 526 F.2d at 1052; *see also Association of Pacific Fisheries v. EPA*, 615 F.2d at 818; *Kennecott v. EPA*, 780 F.2d at 456.

[336] *See* 1977 Leg.Hist at 636 (projecting that the plant closures would generally be limited to small, single plant firms). Rather than exempting small plants from compliance with pollution-control standards, Congress

In the light of Congress' judgment that society must bear such costs as the price of achieving the long-term benefits of eliminating pollutants from our nation's waters, courts have been exceedingly reluctant to invalidate environmental regulations on grounds of cost—even in cases where the economic impact was more severe than in the instant case.[337]

2. Validity of EPA's Cost Assessment

SOCMA further disputes the EPA's use of vendor-supplied package biological treatment plants in estimating the cost of PSES to small plants. SOCMA's argument is premised on the contention that none of the model technologies selected by the EPA—let alone the package biological treatment plants—will be able to achieve PSES. Thus,

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initially established a Small Business Administration loan program for water pollution control facilities as a means of addressing potential small-plant closures. Congress contemplated that small plants facing difficulties in complying with effluent limitations under the Act would resort to low-cost loans, available under this program, as an alternative to forced plant closings. *National Crushed Stone Ass'n*, 449 U.S. at 81; 101 S.Ct. at 305; 1972 Leg.Hist. at 1353.

This program formerly codified at 15 U.S.C. § 636(g), was replaced by Pub.L. 97-35, Title XIX, § 1913(c), 95 Stat. 780 (1981).

[337] For example, in *National Ass'n of Metal Finishers v. EPA*, 719 F.2d at 660, 666, the court approved a projected 20% closure rate for the electroplating industry and the loss of more than 737 firms and 12,000 jobs. The Third Circuit likewise sanctioned a 14% closure rate for integrated steel plants in the iron and steel industry, *American Iron & Steel Inst.*, 526 F.2d at 1054, as well as an employment disruption for an estimated 5400 persons in the metal finishing industry. *See Ford Motor Co. v. EPA*, 718 F.2d 55, 58 (3rd Cir.1983). The Ninth Circuit held a 16% plant closure rate for direct dischargers in the seafood processing industry and a closure rate of approximately 50% of the plants in two of the smaller subcategories in that industry to be acceptable. *See Association of Pacific Fisheries*, 615 F.2d at 808. In addition, a loss of 1800 jobs or 1.5% of the total employment for the pulp and paper industry was sanctioned in *Weyerhaeuser Co. v. Costle*, 590 F.2d at 1047.

SOCMA argues, small plants will in fact have to bear the greater cost of more extensive treatment than the EPA has estimated to be necessary.

We held above, however, that the EPA's choice of model technologies for BAT (and thus for PSES) was reasonable and that the record supported the EPA's conclusion that BAT limits could generally be achieved using the model technologies. SOCMA has failed to point to any record evidence that would undermine our earlier conclusion. We therefore hold that PSES are not arbitrary due to EPA's reliance on package biological treatment as a model technology for PSES.

3. Alternative Pretreatment Standards

Finally, SOCMA claims that the EPA's data indicate that a few small plants account for a majority of the pollutant loadings and that a limited number of pollutants account for most discharges by small plants. SOCMA argues that the EPA could have promulgated PSES based on these factors that would not have had such a severe impact on small dischargers. SOCMA's alternative approach would impose a limitation on the mass or pounds of pollutants that a small plant may discharge to a POTW. SOCMA seeks to limit individual dischargers to a total of 25 pounds per day, or alternatively, to 100 pounds per day, of only 16 "dominant" pollutants. SOCMA asserts that this approach would result in the worst polluters bearing a more proportionate share of the costs of compliance.

The EPA responds that SOCMA's proposal would result in unacceptably high annual loadings of 9,125 and 36,500 pounds per plant, respectively. Such a result, the EPA argues, would be inconsistent with Congress' intent that indirect dischargers achieve the same levels of removal as their direct-discharging counterparts,[338] performing in this

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[338] 1977 Leg.Hist. at 271, 342, 403; 52 Fed.Reg. 42,547.

case as well as those direct dischargers that comply with BAT standards. The EPA notes that pretreatment is not limited to "significant" removals, "dominant" pollutants or "large dischargers" but is intended to achieve a uniform standard of removal throughout the OCPSF industry.

It is well established that the Agency's regulatory approach may not be invalidated simply because petitioners purport to have identified an alternative, less burdensome approach.[339]

We conclude that SOCMA has not demonstrated that the EPA's refusal to create a subcategory, subject to less stringent standards, for small dischargers was arbitrary, capricious or contrary to law.

D. Application of PSES to Paint/Resin Plants

The National Paint and Coatings Association (NPCA) challenges the inclusion of paint manufacturers with subsidiary resin operations (paint/resin plants) in the scope of the national PSES rule for the OCPSF industry. NPCA argues first that the EPA failed to consider the unique characteristics of paint/resin plants and relied, in setting PSES, on data from other types of plants which are different in several crucial respects from paint/resin plants. As a result, NPCA maintains, the PSES are not technologically or economically achievable for combined paint/resin plants and are therefore not lawful absent the creation of a special subcategory. NPCA also argues that the EPA has in effect withdrawn the exemption from national effluent-pollution guidelines granted to paint manufacturers under the consent decree in *NRDC v. Train*. Lastly,

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[339] *American Petroleum Inst. v. EPA*, 661 F.2d at 353 (upholding EPA's regulatory choice even though other options more tailored to the needs of a particular industry were available); *CPC Int'l, Inc. v. Train*, 515 F.2d at 1046 n. 30 (existence of alternative regulatory paths does not invalidate paths chosen by the Agency).

NPCA argues that the final rule is unclear as to which paint/resin operations will be subject to PSES.

1. The EPA's Data Base

NPCA maintains that the EPA's data base was inadequate to establish PSES for combined paint/resin plants because the EPA included no such plants in its data base, but relied instead on data from plants employing continuous rather than batch production processes and from large chemical/polymer plants with larger and less variable wastewater flows.

With regard to NPCA's first claim, it is well-established that, in identifying model technologies, the EPA may use performance data from one part of an industry for another part of that industry if there is sufficient basis in the record to support the EPA's conclusion that the data are applicable.[340] In this case, we find sufficient basis in the record to support EPA's conclusion that its data were applicable to combined paint/resin facilities.

The EPA notes that, while it did not sample any wastewater from combined paint/resin facilities,[341] it did sam-

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[340] *Tanner's Council of America, Inc. v. Train*, 540 F.2d at 1192-93; *FMC Corp. v. Train*, 539 F.2d at 985. A pertinent factor in assessing the reasonableness of the use of such data is whether raw waste levels are comparable. *C & H Sugar Co. v. EPA*, 553 F.2d at 287-88; *Weyerhaeuser Co. v. Costle*, 590 F.2d at 1054 n. 70; *Association of Pacific Fisheries v. EPA*, 615 F.2d at 816-17. Comparable raw waste levels have been held to provide a reasonable basis for concluding that plants can achieve the same levels of removal. *Kennecott v. EPA*, 780 F.2d at 457; *Reynolds Metals Co. v. EPA*, 760 F.2d at 559-62.

[341] The EPA explained that it did not sample any wastewater from combined paint/resin facilities because the Agency generally expends its limited resources sampling plants that have installed wastewater treatment technology that can serve as a basis for regulations. The EPA asserts that it therefore did not sample wastewater from combined paint/resin plants because the paint industry does not perform substantial treatment on its wastewater.

ple the wastewater from six plants manufacturing resins typically associated with paint production (five of them, like paint/resin plants, employed batch processes).[342] The EPA expressly found that wastewater characteristics from resin manufacture would be the same regardless of where the resin was manufactured:

> The resin manufacturing polymerization processes (e.g., bulk, addition, and condensation) are essentially identical chemical processes whether conducted in a paint formulation facility as captive or in-secondary OCPSF facility for use in secondary paint formulation at that same facility or for sale to a paint formulation facility. Likewise, the characteristics of the wastewaters produced in resin manufacturing are essentially identical.[343]

Raw wastewaters from resin-manufacturing plants were found typically to contain organic pollutants in the same concentration as the untreated wastewaters of the plants that the EPA used to establish PSES.[344] In many cases, raw resin wastewater contains significantly lower concentrations of pollutants, including organic pollutants, than the raw wastewater of the plants in the EPA's data base.[345]

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[342] The EPA Contractors Engineering Report: Analysis of Organic Chemicals and Plastics/Synthetic Fibers Industries 1981, Appendix S, *reprinted in* Joint App. at 4671-75. The EPA sampled untreated wastewaters at six different resin production facilities manufacturing resins that are typically used as raw materials for paints.

[343] Agency Response to the July 17, 1985 and Oct. 11, 1985 Notices of Availability of New Information, Comment 501, *reprinted in* Joint App. at 3037.

[344] The technological basis for treating organic pollutants at PSES is stream stripping and in-plant biological treatment. 52 Fed.Reg. 45,538-39.

[345] EPA Contractors Engineering Report, *reprinted in* Joint App. at 4674-75.

The EPA also found that pollutants in untreated resin wastewater are within the concentration ranges of pollutants with the same determinative physical properties that are present in the untreated wastewaters of the plants used to establish PSES[346] and are therefore susceptible to those model treatment technologies for PSES which depend more on the pollutants' physical properties than on pollutant concentration.[347]

We find that the EPA has adequately considered whether its data for establishing PSES are applicable to paint/resin plants. We cannot conclude on this record that the EPA acted arbitrarily in subjecting combined paint/resin plants to PSES.

2. Achievability

NPCA argues that combined paint/resin plants will be unable to achieve PSES because their wastestreams combine wastewater from the paint production process—which is *not* subject to OCPSF standards—with wastewater from the resin production process—which *is* subject to OCPSF standards. The EPA proposed two methods of treating OCPSF wastewater from paint/resin manufacture: First, the wastewater can be treated on a combined basis—with the resin portion of the flow receiving an allowance based on the OCPSF rule and the paint portion of the flow receiving an allowance based on the combined wastestream formula.[348] Second, the wastewater from resin manufacture can be segregated from the wastewater from paint production and either treated separately on site or hauled on contract to a different treatment facility. In most cases,

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[346] *See, e.g., Kennecott v. EPA*, 780 F.2d at 456; *Reynolds Metals Co. v. EPA*, 760 F.2d at 559-62 (upholding limitations and standards because of wastewaters' similar physical properties).

[347] Dev.Doc. VII 31-32, 18-19, 26, *reprinted in* Joint App. at 3731-32, 3718-19, 3726.

[348] 40 C.F.R. § 403.6(e).

the EPA assessed the compliance costs of this latter option (separate treatment) and found the costs to be economically achievable.

NPCA asserts that neither method will make PSES achievable for combined paint/resin plants. First, NPCA maintains that the combined wastestream formula will operate to impose an impossibly stringent standard for treating combined wastestreams. Second, NPCA claims that altering the plants to allow for separate treatment of the two wastestream components would be too costly.

With respect to NCPA's first objection, the EPA responds that NPCA has misinterpreted the formula: the combined wastestream formula adjusts the discharge limit established by the relevant categorical pretreatment standard (here the OCPSF standard) where the wastestream regulated by that pretreatment standard is combined with other wastewaters prior to pretreatment by the indirect discharger.[349] If the wastestream is combined with specified types of dilution wastestreams, the formula provides that the allowance be reduced to reflect the portion of the flow attributable to the dilution stream.[350] If, on the other hand, a regulated stream is combined with an unregulated stream, the concentration limit for the regulated "nondilute" pollutant in the combined stream remains unchanged.[351]

The EPA asserts that NPCA's objections rest on the incorrect assumption that the EPA would treat the paint stream as "dilution flow" for purposes of applying the formula. Thus, NPCA contends, the allowance which would otherwise apply to the regulated, OCPSF resin portion of the wastestream would be reduced by an amount proportionate to the unregulated paint flow, so that the combined

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[349] *National Ass'n of Metal Finishers v. EPA*, 719 F.2d at 650-56.

[350] 40 C.F.R. § 403.6(e)(1)(i) & (ii).

[351] *National Ass'n of Metal Finishers*, 719 F.2d at 652.

stream would have to meet the OCPSF standards, thereby imposing an impossible standard on plants choosing to treat combined streams. The EPA argues, however, that paint flows would not be treated as dilution flows for purposes of the formula. Dilution flows receive no allowance under the EPA's combined wastestream formula while unregulated but "non-dilute" streams (such as those from paint manufacture) would receive the same allowance as the regulated flow (i.e., the OCPSF resin flow). The allowance otherwise applicable to the resin portion of the wastestream would therefore remain unchanged for paint/resin plants treating combined wastestreams. That is, plants treating combined t§streams would not be required to meet a more stringent standard than plants treating the paint and resin wastestreams separately.

Because NPCA's objections to the combined wastestream formula are based upon an interpretation of the formula that the EPA has explicitly rejected, the EPA concluded reasonably that the PSES were economically achievable for paint/resin plants treating combined wastestreams. The EPA, therefore, determined reasonably that the PSES could be achieved by at least one of the two methods proposed for paint/resin plants.

NPCA further asserts that the EPA failed to consider other "unique" characteristics of combined paint/resin plants that will make PSES unduly costly and therefore unachievable. NPCA argues that combined paint/resin plants are different from primary OCPSF production plants with respect to processes employed, wastewater volumes, wastewater characteristics, and age of equipment and facilities. The EPA responds that it not only took these factors into account, but also did so on a plant-by-plant basis and determined that the PSES were economically achievable for combined paint/resin facilities.

The EPA notes that as part of its 1985 proposal, it estimated compliance costs for every plant covered by the

OCPSF PSES that had responded to the Agency's request for information pursuant to Section 308 of the CWA. EPA next determined the costs that each plant would incur as a result of the proposed rule.[352] The Agency then determined, based on these cost estimates, that the proposed PSES were economically achievable for each subcategory.

We find that the record supports the EPA's contention that in evaluating costs on a plant-by-plant basis, it considered all of the factors that NPCA claims the Agency disregarded: the age of the facilities, the amount and cost of land needed to install treatment equipment, wastewater volumes, the type of treatment equipment needed, and wastewater characteristics.[353] In addition, the EPA developed specific cost estimates for monitoring, capital, operating and maintenance, sludge disposal, and land.[354]

The record similarly contains ample evidence that the EPA's determination that PSES are economically achievable rests on a thorough analysis of compliance costs. In assessing compliance costs for combined paint/resin plants, the EPA assumed that the resin flow would be treated separately from the paint flow and assessed the cost of treating the resin flow accordingly. For smaller plants that have OCPSF flows of under 500 gallons per day and OCPSF production that is less than 205 of the total plant production, the EPA assumed the resin wastewater would be hauled on contract to a different wastewater treatment

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[352] Joint App. at 4695-732 (individual plant cost sheets from record to proposed rule).

[353] An example of such an analysis for a specific plant can be traced through the record. *See* listing of information from 308 Questionnaire (Master Analysis File), *reprinted in* Joint App. at 4827; Duplication of BPT, BAT and PSES Regulatory Compliance Costs for the OCPSF Federal Register Notice of Availability, Table 3, *reprinted in* Joint App. at 4724, 4726.

[354] CMA Comments on EPA's Draft Contractors Engineering Rept. 1982, Appendix C, *reprinted in* Joint App. at 4698.

facility.[355] For plants with larger wastewater flows, the EPA assumed that a separate system would be constructed to treat the resin portion of the flow.[356]

Based on these estimates, the EPA concluded that PSES were economically achievable for OCPSF indirect discharges.[357]

The EPA also endeavored to account for unanticipated costs by considering whether the economic impact of PSES would increase if compliance costs for indirect dischargers increased by 10% or 20%. The EPA found that this hypothetical increase in compliance costs would cause few additional plant or product line closures in the OCPSF industry.[358] Thus the EPA concluded that PSES would remain economically achievable for these plants even if compliance costs were to exceed the EPA estimates by 20%.[359] In the light of the EPA's detailed analysis of compliance costs, we cannot conclude that the Agency's determination that PSES are economically achievable for paint/resin facilities and for the industry as a whole is arbitrary and capricious.

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[355] Agency Response to 1985 Notices, Comment #642, *reprinted in* Joint App. at 3044.

[356] This type of worst-case assumption has been upheld as a valid means of assessing compliance costs. *Ford Motor Company v. EPA*, 718 F.2d at 58.

[357] 52 Fed.Reg. 42,548.

[358] Economic Impact Analysis of Effluent Limitations for OCPSF, Sept. 1987, Table 7-1, *reprinted in* Joint App. at 5913; Printouts for Sensitivity Analysis Used in Final Report, *reprinted in* Joint App. at 5586-601.

[359] *See Reynolds Metals Co. v. EPA*, 760 F.2d at 566-67 (failure to consider a particular cost does not affect reasonableness of Agency's effort where Agency considered other possible costs and Agency stated that additional costs would not affect regulation's economic achievability).

3. The *NRDC v. Train* Consent Decree

NPCA further argues that the OCPSF rule effectively withdraws the exemption from national effluent guidelines given to paint manufacturers in Paragraph 8 of the consent decree in *NRDC v. Train*. NPCA contends that by regulating combined paint/resin wastestreams, the EPA is attempting to regulate exempt paint-manufacturing wastewater through a "back door."

The EPA asserts that this argument is premised on the same misconstruction of the combined wastestream formula discussed above. NPCA assumes erroneously that paint wastestreams will be treated as dilution flows for purposes of the formula so that the allowable level of pollutants would be reduced to account for dilution—effectively subjecting the paint component of the wastestream to PSES. However, as the EPA explains, resin wastewaters would have to meet the same standards under the formula whether or not they are combined with paint formulation wastewaters. Thus, the formula does not result in impermissible regulation of the paint wastewater in a combined flow.

The EPA also notes that wastewaters from paint and resin production may be treated separately. A plant could choose this method of separate treatment without affecting its treatment of paint wastewater which is exempted from the national effluent guidelines under Paragraph 8 of the consent decree. We agree that the EPA's regulation of combined paint/resin plants does not violate Paragraph 8 of the consent decree.

4. Subcategorization

NPCA also argues that the EPA acted arbitrarily in declining to create a separate subcategory for paint/resin facilities. We held above that the EPA reasonably included paint/resin facilities in the OCPSF PSES and further up-

held the EPA's determination that such plants would not experience any uniquely burdensome costs that would make PSES unachievable with respect to them.

The EPA's decision not to create a special subcategory is subject to the same standard of reasonableness.[360] In the light of our earlier conclusions, we find the EPA's decision not to create a subcategory for paint/resin facilities to be well-supported by the record and entirely reasonable.

NPCA argues finally that the OCPSF regulations are ambiguous in defining the scope of their coverage so that NPCA members cannot determine which resin operations at their plants are subject to PSES. The EPA's final regulation states:

> The provisions of this part are applicable to process wastewater discharges from all establishments or portions of establishments that manufacture the organic chemicals, plastics, synthetic fibers . . . products or product groups covered by Subparts B through H of this regulation and are included within the following . . . Standard Industrial Classification (SIC) major groups:
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> (1) [SIC] 2821—Plastic Materials, Synthetic Resins, and Nonvulcanizable Elastomers.[361]

The PSES exempts plants whose operations have been historically reported in and are included under a particular set of SIC groups.[362] Thermoplastic and thermosetting resin production, which includes the resins associated with the

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[360] *See, e.g., Reynolds Metals Co. v. EPA*, 760 F.2d at 564; *BASF Wyandotte Corp. v. Costle*, 598 F.2d at 655; *American Iron & Steel Inst. v. EPA*, 568 F.2d at 297-99; *American Iron & Steel Inst. v. EPA*, 526 F.2d at 1043.

[361] 52 Fed.Reg. 42,569. (to be codified at 40 C.F.R. § 414.11(a)).

[362] 52 Fed.Reg. 42,569-70.

paint industry, are covered by subparts D and E of the regulations.[363] Thus, if a combined paint/resin facility has resin operations that fall within SIC 2821 (synthetic resin production) and the operation is not properly classified within one of the SIC groups exempted under 40 U.S.C. § 414.11(c), then that operation is subject to the regulations. We agree with the EPA that the scope of the regulation's coverage, contrary to NPCA's contentions, is clear.

E. The EPA's Decision Not to Subcategorize on the Basis of POTW Removal Credits

Petitioners Gulf Coast Waste Authority (GCWDA), Air Products, Ethyl, and PPG seek to remand the PSES on the basis of the EPA's decision not to subcategorize the industry to account for individual POTW removal rates. Ethyl claims that PSES may not be issued in the absence of removal credits, because the credits provision[364] was Congress' means of ensuring against redundant treatment. The remainder of these petitioners—the Gulf Coast Regional Treatment Authority and its users—claim that GCWDA provides, or can provide, adequate removal of the pollutants addressed in the OCPSF regulations for direct dischargers so that imposition of pretreatment standards on the industrial users of GCWDA's POTWs will result in costly and redundant treatment in violation of the Act. These petitioners seek to invalidate the PSES on this basis.

We conclude that the EPA acted reasonably and consistently with the Act in declining to establish a separate subcategory for users of allegedly exemplary POTWs. Although both GCWDA and the Village of Sauget submitted extensive data regarding their treatment systems, the grounds for our decision make it necessary to address

[363] 52 Fed.Reg. 42,572-76.

[364] 33 U.S.C. § 1317(b)(1).

whether the EPA properly found their performances to be less than exemplary.[365]

1. Removal Credits

Petitioners argue that it was unlawful for the EPA to refuse to form a subcategory, based on the performance of an individual POTW, because the only other avenue for the consideration of that factor—the removal credits provision—had been foreclosed by Congress, pending the EPA's promulgation of comprehensive sludge regulations.[366] In other words, petitioners claim that the current unavailability of removal credits compels the EPA to consider the effectiveness of individual POTWs' performance in the context of the national rulemaking.

As with our discussion of FDF variances above, we must reject petitioners' attempts to compel the EPA to address highly individualized issues in the context of a national rulemaking. A holding to the contrary would undermine Congress' efforts to facilitate the promulgation of national, categorical standards for water quality, while providing a separate mechanism to address issues relating to individual POTWs. We furthermore reject petitioners' contentions that the unavailability of removal credits renders the promulgation of PSES unlawful absent some other mechanism for considering the performance of an individual POTW.

Congress enacted the removal-credits provision to provide a means for industrial pretreaters to seek exemptions, based on a POTW's removal capabilities, from the pretreatment standards. The statute provides:

> If, in the case of any toxic pollutant under subsection (a) of this section introduced by a source into a pub-

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[365] 52 Fed.Reg. 42,547 (The EPA did not find an adequate basis to create subcategories for either GCWDA or the village of Sauget).

[366] 33 U.S.C. § 1345, as amended by Section 406(e) of the Water Quality Act of 1987.

licly owned treatment works, the treatment by such works removes all or any part of such toxic pollutant and the discharge from such works does not violate that effluent limitation or standard which would be applicable to such toxic pollutant if it were discharged by such source other than through a publicly owned treatment works, and does not prevent sludge use or disposal by such works in accordance with Section 1345 of this title, then the pretreatment requirements for the sources actually discharging such toxic pollutant into such publicly owned treatment works may be revised by the owner or operator of such works to reflect the removal of such toxic pollutant by such works.[367]

As with the FDF variance scheme discussed above, the removal credits provision, together with Section 307(b)(3) which authorizes the Administrator to "designate the category or categories of sources to which such [pretreatment] standard shall apply," provides a coherent statutory scheme: One vehicle for promulgating categorical regulations of national scope and one vehicle to address concerns relating to individual POTWs. Thus petitioners' interpretation of Section 307(b)(3) to require subcategorization based on POTW removal rates is inconsistent with the statutory scheme. It is axiomatic that statutes must be read as an integral whole and that no part should be read to render inoperative another part of the statute.[368] Petitioners' reading of Section 307(b)(3) would render superfluous the removal-credits provision of Section 307(b)(1) and is inconsistent with the aim of the statute to establish uniform pretreatment standards based upon a comparison

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[367] 33 U.S.C. § 1317(b)(1).

[368] *See In re Timbers of Inwood Forest Associates*, 793 F.2d 1380, 1384 (5th Cir.1986); *NRDC v. EPA*, 822 F.2d 104, 113 (D.C.Cir.1987).

between the performance of the industrial indirect dischargers and that of well-operated POTWs.[369]

Petitioners contend, however, that the statutory scheme has been upset by the suspension of the removal-credits program pending EPA's promulgation of sludge regulations. Petitioners argue that the removal-credits provision was intended to prevent the imposition of costly and redundant treatment requirements. Thus, if removal credits—or some means of considering the performance of an individual POTW—are not available, petitioners contend that the imposition of PSES is itself unlawful.

While we recognize that petitioners may feel caught in a catch-22, the trap is of Congress' making, and we may not circumvent Congress' clear intent that removal credits may not be granted until EPA promulgates sludge regulations. The CWA, as amended by the Water Quality Act of 1987, adopted the Third Circuit's decision to prohibit the award of removal credits pending the final promulgation of sludge regulations—with full knowledge of the implications for indirect dischargers.[370] Section 406(e) provides in full:

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[369] *See* H.R.Rep. No. 911, 92d Cong. 2d Sess. 113 (1972), *reprinted in* 1972 Leg.Hist. at 800 (emphasizing that the pretreatment standards are national in scope); *see also Cerro Copper Products Co.*, 766 F.2d 1060, 1067 (7th Cir.1985). In *Cerro Copper*, the Seventh Circuit considered a claim, also involving the Village of Sauget's POTW, virtually identical to that presented here. The petitioners similarly claimed that the EPA had failed to consider their unique situation when it promulgated uniform national wastewater pretreatment standards. In rejecting Sauget's attack on the EPA's pretreatment standards, the Seventh Circuit emphasized that the legislative history of the Act clearly indicates that Congress intended EPA to promulgate wastewater pretreatment standards on a national basis. The court found that Congress expressly intended that the EPA not take into account the individual characteristics of each POTW facility when establishing national wastewater pretreatment standards for the various industrial categories. *Id.* at 1068.

[370] WQA § 406(e), 33 U.S.C.A.§ 1345 note.

> The part of the decision of *Natural Defense Council, Inc. v. U.S. Environmental Protection Agency,* [790 F.2d 289] (3d Cir.1986), which addresses section 405(d) of the Federal Water Pollution Control Act is stayed until August 31, 1987, with respect to (1) those publicly owned treatment works the owner or operator of which received authority to revise pretreatment requirements under section 307(b)(1) of such Act before the date of the enactment of this section, and (2) those publicly owned treatment works the owner or operator of which has submitted an application for authority to revise pretreatment requirements under such section 307(b)(1) which application is pending on such date of enactment and is approved before August 31, 1987. The Administrator shall not authorize any other removal credits under such Act until the Administrator issues the regulations required by paragraph 2(A)(ii) of § 405(d) of such Act, as amended by subsection (a) of this section.[371]

Moreover, when Congress addressed the removal-credits issue in 1987, it was fully aware that there was, and would continue to be, delay in promulgating the sludge regulations and thus in implementing the removal-credits program. Congress chose to enact only a limited stay of the Third Circuit's decision in *Natural Resources Council v. Environmental Protection Agency*—to allow those POTWs with approved removal-credit programs and those with pending applications approved during the stay period to continue to operate a removal-credit program on an interim basis until August 31, 1987, the date by which the EPA was directed to promulgate sludge regulations.[372]

When the Water Quality Amendments were enacted on February 4, 1987, the statutory deadline for proposing an

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[371] *Id.*

[372] *Id.*

initial round of sludge regulations for the first 20 pollutants—November 30, 1986—had already passed.[373] Thus, it was almost certain at that time that the EPA would be unable to promulgate final sludge regulations by August 31, 1987. In addition, the statutory deadline for promulgating the second round of sludge regulations for the remainder of the priority pollutants was June 15, 1988.[374] We must therefore conclude that Congress recognized that the limited stay is had enacted would expire well before the reinstatement of removal credits. Since Congress did not amend the Act to provide alternative relief for indirect dischargers based on exemplary performance by a POTW, we must infer that Congress intended that dischargers would comply fully with the pretreatment standards, regardless of the level of treatment afforded by the discharger's POTW and in spite of the suspension of the removal credits program.

This conclusion is consistent with Congress' concern that pretreatment standards for industrial users of POTWs not be weakened through the award of removal credits prior to EPA's promulgation of sludge contamination regulations.[375] Congress originally intended that the authority to relax pre treatment standards through removal credits would be "available only under certain limited conditions if the sludge from POTWs meets the standards established under section 405(d) of the [Act]. This precaution ensures that disposal of sludge from POTWs would not be contaminated by the added pollutant that POTWs receive when pretreatment standards are relaxed."[376] Were the EPA to create a subcategory for petitioners based on the removal

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[373] *See* 33 U.S.C. § 1345(d)(2)(A)(i).

[374] 33 U.S.C. § 1345(d)(2)(B)(ii).

[375] *See* 132 Cong. Record S16,428 (daily ed. Oct. 16, 1986) (statement by Senator Stafford).

[376] *Armco, Inc. v. Environmental Protection Agency*, ___ F.2d at ___ (6th Cir. March 15, 1989).

capabilities of the GCWDA or Village of Sauget POTWs, it would in effect be granting the users of those facilities removal credits in the absence of sludge regulations. This result is directly contrary to the Act.

We recognize, as another court has stated, that:

> [T]his may cause economic hardship for Plaintiffs and other indirect dischargers, because they will be required to meet the same standards as direct dischargers. The treatment equipment the dischargers may have to install may become superfluous when the EPA again can approve removal credits. However, Congress and the EPA are the only bodies which can obviate the need for purportedly redundant facilities.[377]

If petitioners wish to challenge EPA's failure to promulgate sludge regulations, they may do so by bringing an action in the district court under the FWPCA's "citizen suit" provision.[378] We do not have jurisdiction in an action brought to review the Agency's promulgation of effluent guidelines to address the Agency's *inaction* in failing to promulgate sludge regulations.[379]

2. GCWDA & Village of Sauget's POTWs

The EPA concluded, on the basis of record submissions by users of the GCWDA and Village of Sauget POTWs,

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[377] *Chicago Association of Commerce & Industry v. Thomas*, No. 87-C-6353, slip op. at 13 (N.D.Ill. Oct. 27, 1987) [1987 WL 19166] (rejecting challenge to EPA's refusal to process POTW's application for removal credits after expiration of statutory stay).

[378] *Armco*, at ____.

[379] *Id.* at ____-____. As we explained with respect to EPA's delay in processing applications for FDF variances, suits to compel agency action must be brought in the first instance in the district court. We have jurisdiction in this case, pursuant to Section 509(b)(1) of the Act, 33 U.S.C. § 1369(b)(1), only to review the Agency's *action* in promulgating effluent and pretreatment standards under Section 307 of the Act. *See Armco*, at ____.

that the comments did not provide information regarding any particular POTW's removal of the relevant toxic pollutants that was sufficient to provide a basis for separate consideration.[380] Because we hold above that the EPA properly declined to create special subcategories based on the performance of an individual POTW, and that any decision to the contrary would in fact violate the Act, we need not address here the sufficiency of the data that GCWDA and Sauget submitted in support of their claim for special treatment.

3. Consent Decree

Finally, petitioners argue that because GCWDA is bound by a consent decree which requires GCWDA's industrial POTWs to meet the effluent guidelines mandated by Section 301 of the CWA—including BAT—the imposition of PSES on GCWDA's users would result in redundant treatment, contrary to the Act.

As the EPA accurately notes, however, the consent decree itself provides that "[i]t shall be Gulf Coast's prerogative and responsibility to commence appropriate enforcement actions against any contributor which violated any pretreatment standard."[381] Thus, the terms of the consent decree clearly contemplate that GCWDA's users will continue to be subject to pretreatment standards, in spite of the stringent requirements on GCWDA's own treatment process. GCWDA can hardly maintain that it would be inconsistent with the consent decree to impose pretreatment standards on its users.

In summary, we find that the EPA properly found petitioners to be subject to PSES. The EPA's refusal to create a separate subcategory for the users of Sauget's

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[380] 52 Fed.Reg. 42,547.

[381] *United States v. Crown Central Petroleum Corp.*, No. H-80-484, slip op. at ¶ VIIIA (S.D. Tex., Sept. 11, 1981).

or GCWDA's facilities was rational and indeed compelled by the Act.

V. *New Source Performance Standards (NSPS) Issues*

We now turn to the challenge presented by the NRDC that the EPA violated the Clean Water Act by basing New Source Performance Standards (NSPS) and Pretreatment Standards for New Sources (PSNS) upon BPT for conventional pollutants and upon BAT model technology for toxic discharges.

NRDC argues that effluent limitations for newly constructed dischargers represent the highest level of technology-based treatment under the Clean Water Act. In promulgating the New Source Performance Standards, according to NRDC, Congress intended that new facilities would be required to take advantage of the most current process and treatment innovations, irrespective of whether the cost of the new technologies is justified by any incremental degree of removal achieved by its application. The reason for dropping the cost-benefit analysis from the NSPS, according to NRDC, was the recognition by Congress that new facilities are not limited by cost and engineering constraints inherent in retrofitting existing plants. Congress also recognized that new sources are uniquely situated to push toward the outer envelope of pollution control technology in a way that will further progress toward the national goal of eliminating the discharge of all pollutants.

Instead of establishing effluent guidelines that would tend to achieve these legislative purposes, however, the EPA final rules set out standards for new sources identical to those for existing plants. This, the NRDC urges, violates section 306 of the Clean Water Act.

Initially, the EPA argues that NRDC is foreclosed from presenting these issues on appeal because it had an obli-

gation to direct the Agency's attention to them during the notice-and-comment period but failed to do so. It is true that we will look less favorably upon the arguments of a party that complains of agency action for the first time on appeal when an opportunity existed to address its concerns to the agency during notice and comment.[382] However, NRDC asserts that the EPA final rule for NSPS varied greatly from the Agency's initial proposals, which considered additional treatment technologies for new sources. NRDC was not opposed to these preliminary proposals. We decline to foreclose argument on appeal by requiring a party to object during notice and comment to an Agency proposal that it did not, at that time, find ojectionable. We now turn to the merits of the NRDC challenge.

1. The EPA's Cost Test in Establishing NSPS

First, NRDC asserts that the EPA used the same cost test for new and existing sources when Congress intended the Agency to use a "stricter cost test" for evaluating the efficacy of treatment technologies for new sources. According to NRDC, the EPA improperly compared "the costs of incremental pollution control technology against water quality benefits," thereby rejecting at least one new treatment technology on the basis of a cost-benefit analysis.

The EPA responds that the Act requires the Agency to "take into consideration the cost of achieving [NSPS] reduction, and any non-water quality environmental impact and energy requirements."[383] This test, the EPA urges, is identical to the cost requirement for establishing BAT. The use of BPT and BAT costing methods to determine the

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[382] *Reynolds Metals Co. v. EPA*, 760 F.2d at 563; *see* Section VI *infra*.

[383] 33 U.S.C. § 1316(b)(1)(B).

cost of entirely new treatment systems for new sources was, according to EPA, entirely reasonable. The Agency denies that it compared these costs to the benefits accrued from compliance with NSPS.

We are not convinced that the EPA's costing methods for promulgating NSPS violated the Act. With respect to toxic pollutants, we agree that the statutory test for evaluating the costs of NSPS treatment is identical to that required for establishing BAT standards. In both cases, the Administrator must inquire into the initial and annual costs of applying the technology and make an affirmative determination that those costs can be reasonably borne by the industry. Congress may have contemplated that it would cost less to install new technologies in new plants than to retrofit old plants to accommodate new treatment systems. However, the determination whether that contemplation held true, in fact, with respect to any particular technology, was left by statute to the discretion of the Administrator.[384]

For plants that discharge conventional pollutants, the EPA points out that new sources must install secondary clarifiers, biological treatment limits, equalization and other treatment technologies. BPT costing methods, according to the EPA, provide a framework for estimating the capital and operating costs of such systems. Given the legislative grant of discretion vested in the Administrator to determine the economic feasibility of costs under NSPS, we cannot say, on the basis of this record, that the methods used constitute a violation of the Act.

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[384] 33 U.S.C. § 1316(b)(1)(B). Indeed, even where the EPA's new source effluent standards have proved to be based upon erroneous calculations in costs, at least one federal court has held that the Agency did not abuse its discretion or act arbitrarily in determining that the costs of achieving such effluent standards were reasonable. *CPC Int'l, Inc. v. Train*, 540 F.2d 1329 (8th Cir.1976), *cert. denied*, 430 U.S. 966, 97 S.Ct. 1646, 52 L.Ed.2d 357 (1977).

2. NRDC's Challenge that the EPA Failed to Consider Technology Beyond BPT and BAT

The second reason presented to support NRDC's argument that the NSPS regulations violate the Clean Water Act is the assertion that the EPA failed to give serious consideration to better control technologies that could be used by new sources. Specifically, NRDC points to indications in the record that 26% of OCPSF plants are "zero or alternative discharge" plants and that 36 plants achieve zero discharge through recycling, a technology the EPA allegedly did not consider in its rulemaking.

The EPA argues that new technologies must be "demonstrated" to achieve more stringent limitations and that they must be "available" in the OCPSF industry before such technologies can form the basis for NSPS. The Agency claims to have considered and rejected technologies other than BPT and BAT. It found, for instance, that requiring filtration in addition to biological treatment for conventional pollutants had not been adequately demonstrated to accomplish better effluent results for the OCPSF industry. As another example, the Agency considered requiring the addition of activated carbon for further control of toxic pollutants but rejected it because it had not been well-demonstrated to enhance treatment.

Intuitively, there is some force to the observation that Congress would not have devised a completely new statutory scheme for regulation of new sources if it intended that the effluent standards for such plants would be identical to those required for existing sources. This is especially true when one considers that the statute provides an exemption from more stringent standards of performance than the EPA may adopt under NSPS in the future.[385]

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[385] This exemption has a term of ten years or a period equal to the time it takes to depreciate the facility, whichever is shorter.

The EPA asserts that, at this time, there exist no technologies that have been demonstrated to achieve a greater degree of effluent reduction than existing technologies that meet BPT and BAT standards. The key issue is the meaning attributable to the term "demonstrated." The EPA maintains that "best available demonstrated technology" means "those plant processes and control technology which, at the pilot plant, semi-works, or other level, has [sic] demonstrated both technological performance and economic viability at a level sufficient to reasonably justify the making of investments in such new facilities."[386]

The Third Circuit has concluded, and we agree, that Congress did not intend the term "best available demonstrated control technology" to limit consideration of treatment systems only to those widely in use in the industry. Instead, the present availability of a particular technology may be "demonstrated" if even one plant utilizes the technology in question.[387]

The EPA's only response is that NRDC failed to urge consideration of recycling during rulemaking and is therefore precluded from raising the issue on appeal. As to this, as we have previously pointed out, the failure of a petitioner to raise an issue before the Agency may cause us to view the contention less favorably but does not bar our consideration of it.[388]

We frequently defer to the expertise of the EPA. We do this for good reason. Congress entertains the legitimate expectation that the various federal agencies, charged as they are with responsibility for promulgating highly detailed and technical regulations, will be aware of the events and breakthroughs on the technological frontiers that lie

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[386] EPA brief at 398 (quoting 1972 Leg.Hist. at 790).

[387] *American Iron and Steel Institute v. EPA*, 526 F.2d at 1058.

[388] *Reynolds Metals Co. v. EPA*, 760 F.2d at 563.

within the purview of the agencies' respective fields of expertise.

We do not require, however, that the EPA be fully cognizant of every innovation, wherever employed, that has the potential to achieve greater reductions in the discharge of pollutants into our environment. And we recognize that the purpose of a period of notice and comment during rulemaking is, at least in part, to allow interested parties to bring to the attention of the EPA relevant technologies that may assist the Agency in the discharge of its regulatory duties. Nevertheless, we consider that a treatment system employed by 36 plants in the OCPSF industry is sufficiently common that it is not unreasonable to expect the EPA to know about it. The NSPS statute directs that the "Administrator shall, from time to time, as technology and alternatives change," revise effluent standards for new point sources.[389] We should be able to have confidence that the Administrator will do so, especially since he has chosen at this time to require no more stringent guidelines for new plants than for existing sources.

We know from the record that 36 plants in the industry use recycling and some of them achieve zero discharge. Thus, recycling easily fits the definition of an "available demonstrated technology" under § 306 of the Act. The failure of the EPA even to consider recycling, the, was arbitrary and capricious. We therefore remand these limitations to the EPA for consideration of whether zero discharge limits would be appropriate for new plants in the OCPSF industry because of the existence of recycling.

VI. *The Economic Impact of the Montreal Protocol on the Chlorofluorocarbon Industry*

Kaiser Aluminum & Chemical Corporation (Kaiser) argues that the EPA failed to take into consideration the

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[389] 33 U.S.C. § 1316(b)(1)(B).

impact of the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) when it promulgated effluent limitations as they apply to facilities that produce chlorofluorocarbon (CFC) pollutants. Kaiser operates such a facility in Gramercy, Louisiana.

The Montreal Protocol is an international agreement aimed at reducing the worldwide production of substances that deplete the earth's ozone layer. The United Stated and twenty-one other nations signed the agreement on September 16, 1987. The deadline for execution of the Protocol was January 1, 1989. The Protocol has now been signed by s sufficient number of nations, but subsequent to its execution, it must be ratified by the appropriate legislative or executive authority of each signatory. As of the date of this opinion, the Protocol has not been ratified by a sufficient number of other nations to make is binding.

The terms of the Montreal Protocol call for the freezing, and then the reduction of CFC. Section 157(b) of the Clean Air Act authorizes the Administrator to promulgate regulations that will carry out the goals of the Montreal Protocol.[390] The Administrator has already begun to perform this task.[391]

The Clean Water Act requires the Administrator, when promulgating BPT and BAT guidelines, to consider the total cost of applying the proposed regulations in relation to the effluent-reduction benefits the guidelines are likely to achieve.[392] The crux of Kaiser's argument is that 1) the reduction in production of CFC required by the Montreal Protocol will adversely affect the profitability of Kaiser's Gramercy Plant and other plants like it; 2) such an adverse effect is a "cost" that the EPA should have considered

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[390] 42 U.S.C. § 7457(b).

[391] *See* 53 Fed.Reg. 30,566, 30,598-602 (1988) (to be codified at 40 C.F.R. §§ 82.1-14).

[392] 33 U.S.C. § 1314(b)(1)(B) (1972).

when it promulgated OCPSF guidelines; and 3)because the Administrator did not consider the impact of the Montreal Protocol upon the CFC industry, the effluent guidelines are arbitrary and capricious.

The EPA responds that the impact of the Montreal Protocol upon the CFC industry was entirely speculative at the time of the rulemaking because the agreement had not been ratified, and, indeed, it still remains unratified. Thus, it amounts to nothing more than an "unenacted legislative proposal" which the Agency was not required to consider during rulemaking. Indeed, the OCPSF final rule was published on November 5, 1987, only two months after the signing of the Montreal Protocol and a full year prior to the deadline for its execution.

At the outset, we note that neither Kaiser, nor any of the other petitioners, raised the issue of the Montreal Protocol during the OCPSF rulemaking notice and comment period. Although such a failure on the part of petitioners does not dispose of the issue, as we have previously stated, a party responsible for failing to bring its objections to an agency's attention during the notice and comment period should be given less latitude in complaining about the results.[393]

In any event, we find the EPA's response to Kaiser's challenge persuasive. The limitations established by the Montreal Protocol will be implemented, if at all, under the rubric of the Clean Air Act. Kaiser asserts that all EPA regulations promulgated under the Clean Air Act will directly affect a plant's pollution control systems generally. Of course, this is true. But the same can be said of all regulatory provisions, whatever the source. For example, compliance with a proposed OSHA mandate to improve the lighting at plants in a particular industry will neces-

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[393] *Reynolds Metals Co. v. EPA*, 760 F.2d at 563 (quoting *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011 at 1028 n. 15).

sarily have some effect upon the profitability of those plants. Payment of those costs will directly affect the ability of such plants to meet the additional expense of controlling wastewater discharges. The logical extension of Kaiser's argument would be to require the EPA to factor in the costs of compliance with all proposed OSHA regulations before promulgating its own wastewater effluent guidelines.[394] Such a requirement would render the rulemaking procedure unworkable.

In addition, as we have pointed out, the applicability of, and very existence of costs associated with adherence to, the Montreal Protocol was highly speculative at the time of this rulemaking. We therefore decline to find that EPA's failure to consider them was arbitrary or capricious.

VII. *Scope of the Regulation*

1. The EPA's Reservation of Nonconventional Pollutants and Eight Priority Pollutants for Future Rulemaking

NRDC complains that despite a specific congressional mandate that the EPA control the discharge of toxic pollutants into navigable waterways, the Agency has reserved for future rulemaking promulgation of effluent limitations for eight priority toxic pollutants and a host of other nonconventional pollutants. Petitioners ask this court to find that this reservation for future rulemaking was arbitrary and a violation of the CWA. In effect, NRDC asks us to compel the EPA to promulgate effluent limitations for these pollutants. Petitioner brings this complaint, however, before the wrong forum.

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[394] The data used by the agency to determine the cost of compliance with effluent limitations must often contain the cost of adhering to other Agency regulations. We decline, however, to *require* the Administrator to consider the costs of compliance with all other regulations before promulgating guidelines under the CWA. Such considerations are properly left to the Administrator's discretion.

The CWA establishes a bifurcated jurisdictional scheme whereby the courts of appeal exercise jurisdiction over some categories of challenges to EPA action and the district courts retain jurisdiction over other types of complaints. Any interested person may bring a claim in the federal circuit court of appeals for review of the Administrator's action in, *inter alia,* promulgating any standard of performance for new sources under section 1317.[395] However, the federal district courts, rather than the courts of appeals, have jurisdiction to hear claims that the Administrator has failed to fulfill a mandatory duty to promulgate regulations or that the Administrator has abused his discretion by not promulgating regulations.[396] " '[W]here

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[395] Section 1369 provides, in pertinent part:

> (1) Review of the Administrator's action (A) in promulgating any standard of performance under section 1316 of this title, (B) in making any determination pursuant to section 1316(b)(1)(C) of this title, (C) in promulgating any effluent standard, prohibition, or pretreatment standard under section 1317 of this title, (D) in making any determination as to a State permit program submitted under section 1342(b) of this title, (E) in approving or promulgating any effluent limitation or other limitation under section 1311, 1312, or 1316 of this title, and (F) in issuing any permit under section 1342 of this title, may be had by any interested person in the Circuit Court of Appeals of the United States for the Federal judicial district in which such person resides or transacts such business upon application by such person.

33 U.S.C. § 1369(b)(1) (1972).

[396] Section 1365 provides:

> Except as provided in subsection (b) of this section, any citizen may commence a civil action on his own behalf—
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> * * * * * *
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> (2) against the Administrator where there is alleged a failure of the Administrator to perform any act or duty under this chapter which is not discretionary with the Administrator.

33 U.S.C. § 1365(a)(2) (1973); *see also Environmental Defense Fund v.*

there is alleged a failure of the Administrator to perform any act or duty under [the Clean Water] Act which is not discretionary with the Administrator,' " the Act confers exclusive jurisdiction upon the district court.[397]

NRDC does not complain that the effluent limitations promulgated by the Administrator to control toxic and nonconventional pollutants are in some way defective or deficient. Rather, petitioner seeks to compel the Administrator to promulgate such regulations in the first instance. Such suits clearly lie within the exclusive jurisdiction of the district court.

2. Application of the Regulations to Laboratory Discharges

The regulations apply to wastewater from laboratories operated in conjunctions with and related to existing OCPSF facilities. The EPA chose to regulate on-site OCPSF laboratories "because these operations would most likely generate wastewater with characteristics similar to the commercial manufacturing facility." The regulations exempt research facilities that are not operated in conjunction with OCPSF manufacturing operations.[398]

Ethyl argues that the application of the PSES to laboratory discharges at its Sauget facility is arbitrary because three of the pollutants found in its wastestream and subject to the PSES—chloroform, methylene chloride, and toluene—are not manufactured or used in its manufacturing process. Though Ethyl's brief is less than clear, the unarticulated premise in its argument appears to be that

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EPA, 598 F.2d 62, 90-91 (D.C.Cir 1978) (jurisdiction over claim that EPA should have engaged in additional rulemaking lies exclusively in district court).

[397] *Trustees of Alaska v. EPA*, 749 F.2d 549, 559 (9th Cir.1984) (quoting *Pennsylvania Dept. of Environmental Resources v. EPA*, 618 F.2d 991 (3d Cir. 1980)).

[398] 52 Fed.Reg. 42,523.

the EPA's regulatory authority is limited to pollutants resulting from OCPSF manufacturing operations. Ethyl has failed to provide any authority for this contention, and after an independent review of the Act, we have failed to discover any provision that limits the EPA's regulatory authority to pollutants resulting from the manufacturing, as opposed to the research, process.

CONCLUSION

For the reasons assigned, the petitions for review of the EPA's effluent limitations for the OCPSF industries are denied, but specific portions of the regulations, while remaining in force, are remanded to the Administrator for further proceedings consistent with the opinion. These provisions, challenged by the NRDC, are the EPA's BAT subcategorization of the industry; and the EPA's failure to consider wastestream recycling as a potential technological basis for NSPS.

We will entertain petitions for reconsideration addressed to the panel before issuing our mandate. Petitions for reconsideration must identify specific alleged errors of law or fact material to this court's ruling; point out in detail (with citations to the record, case authority, or both) why it is contended the part of the opinion complained of is in error; and advise the court of the alleged ramifications of those rulings. In these petitions, the parties must not present arguments that merely reiterate those made previously. Moreover, the parties are encouraged to consolidate the presentation of any petitions for reconsideration in the manner the parties have heretofore adopted for briefing and oral argument.

United States Court of Appeals,
Fifth Circuit.

Nos. 87-4849, et al.

CHEMICAL MANUFACTURERS ASSOCIATION, et al.,

Petitioners,

v.

U.S. ENVIRONMENTAL PROTECTION AGENCY,

Respondent.

Oct. 10, 1989.

Petitions for Review of an Order of the Environmental Protection Agency.

(Opinion March 30, 1989, 5th Cir. 1989, 870 F.2d 177)

ON PETITION FOR REHEARING AND SUGGESTION FOR REHEARING EN BANC

Before, RUBIN, GARZA, and KING, Circuit Judges.

ALVIN B. RUBIN and KING, Circuit Judges:

At the conclusion of our original opinion[1] we encouraged the parties to file petitions for rehearing in order to ensure that we had given each issue in this complex case its due.[2] After considering the parties' arguments, we now clarify certain aspects of our earlier opinion and grant rehearing and remand two parts of the regulations to the Environmental Protection Agency (EPA) for further rulemaking proceedings. As in our original opinion, we have divided

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[1] 870 F.2d 177 (5th Cir. 1989).

[2] *See id.* at 266.

responsibility for drafting this opinion: Judge King prepared the sections concerning the regulations based on the best practicable control technology (BPT), and Judge Rubin prepared the sections concerning regulations based on the best available technology (BAT). No issues have been raised on rehearing with respect to the parts of the original opinion authored by Judge Garza.

I. *Best Practicable Technology (BPT) Issues*

A. Fundamentally-Different-Factors (FDF) Variance Issues

Several of the petitioners have requested that we clarify that our opinion does not preclude them from seeking an FDF variance. Although we had attempted to make clear that nothing in our opinion should be deemed prejudicial to the petitioners' ability to seek FDF variances, we will address the specific points raised by the individual petitioners in their requests for rehearing.

1. DUPONT

DuPont objects to the language in our opinion which states that "[a]n FDF variance would not exempt petitioners from the limitations; it would merely subject them to less stringent limits using the best technology."[3] DuPont asserts that this is not correct—an FDF variance might allow an applicant to leave its present technology in place or to install technology less costly than the model technology. Because this language was merely dicta, we direct that the final paragraph of part II, F.5,[4] in our original opinion be disregarded. The fact remains, however, that this court may not grant the relief petitioner requests. Under Sections 509(b)(1)[5] and 505(a)(2)[6] of the

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[3] *Id.* at 226.

[4] *Id.*

[5] 33 U.S.C. § 1369(b)(1) (1982 & Supp. V 1987).

[6] 33 U.S.C. § 1365(a)(2) (1982 & Supp. V 1987).

CWA, we do not have jurisdiction in this proceeding to require the EPA to process petitioners' applications in a more expeditious manner,[7] nor may we stay the regulations pending the EPA's actions. As we noted in our original opinion, the Act provides explicitly that an application for an FDF variance " 'shall not stay the applicant's obligation to comply with the effluent limitation guideline or categorical pretreatment standard which is the subject of the application.' "[8]

Therefore, we adhere to our refusal to order the EPA to process FDF-variance applications.

2. UNION CARBIDE

Union Carbide asserts that we may have prejudiced its ability to obtain an FDF variance for its Taft, Louisiana, plant. The discussion of the Taft plant issue in our original opinion may not be sufficiently clear because a number of petitioners had raised plant-specific claims as objections to the EPA's categorical rulemaking and that was one of a number of such claims. At any rate we affirm that such objections must be raised in an FDF variance proceeding, and not in a proceeding of review of the national rules.[9] Our discussion of the Taft plant issue was intended only to hold that the EPA did not err in refusing to address this plant-specific claim in the context of the national rulemaking. Nothing in our discussion should be deemed prejudicial to Union Carbide's efforts to obtain an FDF variance.

3. PONDS PETITIONERS

Finally, the "ponds petitioners" assert that our original opinion[10] mischaracterized their argument—petitioners did

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[7] 870 F.2d at 226.

[8] *Id.* (quoting 33 U.S.C. § 1311(n)(6) (1982 & Supp. V 1987)).

[9] *Id.* at 221-22.

[10] *See id.* at 217-21.

not seek an exemption from the BPT limitations, but sought to have the regulations declared unlawful. Our original opinion made it clear that the objections raised by the ponds petitioners regarding the EPA's consideration of the cost of compliance would not suffice to invalidate the regulations as a whole.[11] We also held that petitioners had failed to establish that the EPA erred in refusing to create a subcategory for plants employing waste stabilization ponds.[12]

In so holding, we stated that "even if Texas Eastman, DuPont, and Air Products are required to install new activated-sludge systems in order to comply with BPT, the costs of these systems would be within the range generally estimated for the industry as a whole," and concluded that this did not provide a basis for "exempting" petitioners from the limits that apply to the rest of the industry.[13] The word "exemption" was intended to refer to petitioners' claim that they should have been subject, as a separate subcategory, to less stringent guidelines because the cost of compliance would be higher for petitioners than for the industry as a whole.

Petitioners now assert that they intended only to question the overall validity of EPA's costing methodology. They observe that there is nothing in the record to support the conclusion that the *actual* costs to petitioners of installing entirely new treatment technology would not be "fundamentally different" from costs to other plants in the industry, and argue that the language in the original opinion is misleading on this point and may be prejudicial to petitioners' efforts to obtain FDF variances.

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[11] *Id.* at 220.

[12] *Id.* at 219.

[13] *Id.* at 220.

Because we may have misconstrued petitioners' argument on the cost issue, we will alter the final paragraph of part II.E.3.[14] to read as follows:

> The EPA concedes that petitioners may be required to install entirely new treatment units consisting of activated sludge and secondary clarification. However, the EPA estimated the costs of such steps for more than a quarter of the plants in the industry which would require upgrades to comply with BPT.[1] We therefore agree with the EPA that the EPA's failure to consider the *actual* cost of installing entirely new treatment systems at three of petitioners' plants does not distort the EPA's overall cost assessments sufficiently to undermine the validity of the BPT limits as a whole.
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> [1] Petitioners assert on rehearing that the record does not in fact support the EPA's contention that it estimated the costs of activated sludge systems for "nearly half of the plants in the industry requiring treatment improvements." *See* 870 F.2d at 219-20. Petitioners' own calculation of 20% was based, however, on *all* of the plants in the industry, rather than only those plants requiring treatment improvements. Upon reexamining the record, we note that the EPA costed activated sludge systems for 59 plants—out of 206 requiring system upgrades (other than contract hauling) and 297 plants altogether.

We adhere to the remainder of our earlier discussion. We express no opinion whether costs, or any other consideration raised by petitioners, would provide a basis for an FDF variance.

B. Phenol PSES Notice & Comment Issue

Our original opinion failed to address one issue raised by petitioners Union Carbide, Allied, and others: whether EPA violated the Administrative Procedure Act by failing

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[14] *Id.* at 219-20.

to afford adequate notice and an opportunity to comment on the inclusion of Phenol in PSES.[15]

Petitioners now rely in part on our resolution of the BAT-subcategory notice and comment issue in favor of NRDC.[16] We found that the EPA had not afforded the parties sufficient opportunity for comment on the Agency's final rule establishing subcategories for BAT because the EPA had indicated in its notice that it would not establish any subcategories for BAT.[17] Our conclusion was based on the following language from the record:

> EPA considered whether the industry should be subcategorized for BAT purposes by evaluating the same subcategorization factors which were considered for BPT. EPA has decided to promulgate a single set of BAT limitations which would be applicable to all OCPSF facilities. . . . The available data for BAT show that plants . . . can achieve similar low toxic pollutant effluent concentrations by installing the best available treatment components. . . . Therefore, *the Agency believes that BAT subcategories do not appear to be necessary for effective, equitable regulation.* However, EPA will continue to explore the possibility of subcategorizing the industry for BAT purposes and invites comments and supporting date on appropriate approaches.[18]

We held that "[t]he last sentence notwithstanding, this notice was not sufficient to fairly apprise interested parties that BAT subcategorization was still a live issue."[19]

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[15] 5 U.S.C. § 553(b)(3), (c) (1988).

[16] 870 F.2d at 235-36.

[17] *Id.* at 236.

[18] 50 Fed.Reg. 29,079; *see* 870 F.2d at 236.

[19] 870 F.2d at 236.

Petitioners contend that until the 1986 proposal—the last proposal document published before the final rule—the EPA had never mentioned phenol in the PSES rulemaking. Petitioners claim, moreover, that the 1986 proposal indicated that the EPA did not intend to include phenol in the PSES limits. Petitioners cite the following language we found inadequate with respect to the BAT-subcategory issue:

> When a pollutant is reduced to similar effluent levels and the pass-through analysis compares average industry to average POTW percent removals, . . . the calculation of percent removal for the POTW and industrial treatment systems becomes a function of influent concentration only for these pollutants rather than a function of actual removal efficiency. . . . [T]he Agency is considering comparing percent removals only for comparable ranges of influent concentrations. Using this approach . . . phenol . . . would not be regulated.[20]

If this were in fact an accurate representation of the record, we might find petitioners' claim to have merit. The record, however, belies petitioners' argument.

First, the EPA's 1986 proposal indicated that the Agency was considering five different options for PSES—one of which, PSES V(a), would exclude phenol, anthracene, and phenanthrene.[21] Second, in language which petitioners have artfully ellipsed from the quotation above, the EPA stated that it was "considering an alternate modification of the pass-through analysis for certain non-volatile organic priority pollutants such as phenol."[22] The EPA then explained how this "alternate" approach would differ from the straight BAT-comparison otherwise employed to

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[20] 51 Fed.Reg. 44,090.

[21] *Id.* at 44,084.

[22] *Id.* at 44,090.

determine pass through. The EPA also qualified its statement: "*if sufficient data exist,* the Agency is considering comparing percent removals only for comparable ranges of influent concentrations. Using this approach, three nonvolatile organic pollutants—phenol, phenanthrene, and anthracene—*which previously required PSES/PSNS standards* would not be regulated."[23] Far from indicating that regulation of phenol was no longer a "live issue," the record demonstrates that excluding phenol from PSES was one option under consideration and would depend on the outcome of further study. The quoted language makes clear that phenol would otherwise be regulated.

This conclusion is consistent with the supporting documents for the EPA's 1985 proposal, which reported the results of the EPA's pass-through analysis. Phenol was included in the table and BAT percent removal for phenol was found to be .8% greater than the POTW percent removal. Under the five or ten percent differential approach that the EPA had considered earlier, phenol would not be regulated. The EPA made clear in its 1986 proposal, however, that it was abandoning the percent differential approach for determining pass through in favor of a straight BAT-comparison approach. This notice should have been sufficient to apprise interested parties that PSES would regulate any pollutant that the EPA had found to be removed less effectively by POTWs than by direct dischargers complying with BAT.

Because the documents supporting the EPA's earlier proposal supplied the information necessary to conclude that phenol would be regulated under the BAT-comparison approach, and because the 1986 proposal itself made clear that phenol would be exempted from regulation only if the EPA chose an "alternate modification of the pass-through analysis," we conclude that petitioners were fairly apprised that phenol might be subject to PSES.

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[23] *Id.* (emphasis added).

C. Publicly-Owned Treatment Works (POTW) Issue

Petitioners Gulf Coast Waste Disposal Authority ("Gulf Coast") and its industrial users request that we alter the portion of our original opinion holding that the EPA properly refused to create a separate subcategory for PSES for users of allegedly exemplary POTWs.[24] Petitioners contend that we erroneously equated subcategorization with the award of removal credits. They assert that removal credits occupy a role distinct from subcategorization. Petitioners argue that PSES depends upon a determination that a given pollutant passes through POTWs without adequate treatment and that subcategorization must therefore be available for the users of POTWs when pass through of certain regulated pollutants does not occur. In contrast, petitioners argue, removal credits may be granted even when POTW treatment is less effective than BAT—that is, even when pass through occurs. Petitioners conclude that we should therefore construe the statute to allow subcategorization based upon the performance of individual POTWs without rendering the removal credits provision meaningless—for removal credits would still apply to the users of less effective POTWs.

In our original opinion, we rejected the contention that the EPA must account for the performance of individual POTWs in its national rulemaking and agreed instead with the EPA's interpretation of the statute.[25] The EPA has interpreted the subcategorization provision to apply to characteristics of the petitioners' own facilities, and not to the characteristics of a POTW used by petitioners. The EPA concluded that the performance of individual POTWs may be considered only in the context of the removal credits provision. Petitioners' arguments in their request

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[24] 870 F.2d at 257-61.

[25] *Id.* at 244-46; *see also Cerro Copper Products Co. v. Ruckelshaus*, 766 F.2d 1060, 1068 (7th Cir.1985).

for rehearing to not persuade us that this interpretation of the statute is unreasonable.

Specifically, we do not find convincing petitioners' argument that subcategorization and removal credits necessarily play distinct roles. Rather, the statute indicates that removal credits are intended to be the mechanism for relieving indirect dischargers from PSES when the POTW and its users are capable, together, of meeting the relevant standards with reduced pretreatment by the indirect discharger. The statute provides that removal credits will be available only when "the discharge from such works does not violate that effluent limitation or standard which would be applicable to such toxic pollutant if it were discharged by such source other than through a publicly owned treatment works."[26] Removal credits simply reallocate between the POTW and the indirect dischargers the responsibility for removing the total amount of pollutant necessary to achieve the applicable limit. Together, the POTW and indirect dischargers must still meet the limits.[27] In other words, if no pollutants "pass through" a given POTW, the indirect dischargers who use that POTW may seek removal credits to maintain the status quo. If removal credits are awarded, the allocation of responsibility between the two parties would remain the same as it was before the promulgation of PSES.

The difference between subcategorization and the award of removal credits is that if a subcategory is created for indirect dischargers using an exemplary POTW, indirect dischargers would not be required first to comply with

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[26] 33 U.S.C. § 1317(b)(1) (1982).

[27] The formula for awarding removal credits is $y = x/1-r$ where x = the discharge limit of a pollutant according to the EPA's pretreatment standards, r = the POTW's consistent removal rate for that pollutant, and y = the revised discharge limit. *Cerro Copper*, 766 F.2d at 1063 n. 1.

pretreatment standards and then to seek removal credits. That is, the status quo would never be altered.

As we explained in our original opinion, however, Congress clearly intended the PSES be promulgated on a national, categorical level and intended the removal credits provision, like the FDF variance provision, to provide a "safety valve" for the resolution of individualized claims.[28]

This conclusion is further supported by our concern that the creation of subcategories for users of exemplary POTWs would contravene Congress' intent in prohibiting the award of removal credits in the absence of sludge regulations. The consequence of either subcategorization or the award of removal credits would be to make the POTW responsible for removing a greater proportion of toxic pollutants than it would have been required to remove if its users complied with PSES. Thus, pollutants that would not otherwise be present in the POTW's influent might contaminate the sludge that the POTW must in turn dispose of.[29] We therefore conclude that we cannot require PSES to be relaxed by subcategorization until such time as the EPA promulgates regulations addressing the presence of toxic pollutants in sludge.[30]

Finally, even if we were to construe the statute to permit the EPA to create subcategories based on the performance of POTWs, we would uphold the EPA's conclusion that the data submitted by petitioners did not provide an adequate basis for establishing a subcategory for the users of the Gulf Coast POTWs. The EPA has

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[28] 870 F.2d at 258-59; *see also Cerro Copper*, 766 F.2d at 1068.

[29] *See Armco, Inc. v. EPA*, 869 F.2d 975, 980 (6th Cir.1989).

[30] We do not find Congress' refusal to establish separate regulations for pollutants which may contaminate sludge to be to the contrary. Congress simply concluded that this concern would be addressed by the regulation of sludge under Section 405(d) of the CWA. *See* 870 F.2d at 248.

adequately explained its reasons for concluding that petitioners' data was insufficient to establish that toxic pollutants consistently do not pass through Gulf Coast's facilities.[31] The variation in the data regarding individual pollutants and Gulf Coast's individual POTWs further supports the view that such claims would be addressed more appropriately under the removal credits provision.

II. *Best Available Technology (BAT) Issues*

A. The EPA's Use of Weighted Averaging in Deriving the Long-Term Averages

In order to derive the BAT limitations the EPA calculated the long-term average performance of the plants in its data base that treated a particular pollutant by weighting the sum of the average of detect and non-detect values reported for each plant.[32] In its initial brief CMA contended that the EPA "fabricated" data by assigning non-detect values to plants that did not report any, thus lowering the long-term averages and the resulting limitations. In our original opinion we stated that assigning non-detect values to plants that did not report them resulted from the EPA's use of the recognized statistical technique of weighted averaging, and upheld the EPA's method as within its discretion.[33]

CMA now contends that the EPA misrepresented its technique as weighted averaging. CMA points out that, in calculating the long-term averages, the EPA assigned the same average proportion of non-detect values to each plant

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[31] In particular, the EPA found it difficult to determine the actual level of pollutants in influent and therefore could not determine the effects of dilution on the POTWs' "removal" rates. As we explained in our original opinion, one of the EPA's central concerns in promulgating PSES was to ensure that dilution of pollutants by POTWs did not substitute for effective treatment. *Id.* at 245-46.

[32] *See id.* at 227.

[33] *See id.* at 227-28.

in the data base even if a particular plant did not report any non-detect values. The EPA assumed, in its own words, "that nondetected values should be weighted in accordance with the frequency with which nondetected values for the pollutant generally were found in the daily-data plants."[34] This assumption, CMA argues, is not supported by the record.

CMA correctly points out that the EPA's assumption initially appears implausible because plants with efficient treatment systems seem likely to report a higher proportion of non-detect values than poorly performing plants. CMA may also be correct that the EPA's statistical procedure is not "weighted averaging" in the usual sense. Nevertheless, it is too late to make these objections. When CMA had an opportunity to comment on the challenged procedure in 1985, it stated that it found the procedure "acceptable:"

> EPA uses a weighting procedure in calculating plant-pollutant long-term averages to account for concentrations in the data base which are below the assigned detection limit. This procedure may be acceptable for this use. It makes the statistical calculations for the variability factor more tractable and, more importantly, comes closer to representing an analytically identifiable concentration. It should be emphasized, however, that this procedure overestimates the mass of priority pollutants being discharged by a substantial amount.[35]

CMA now seems to have concluded that the EPA's methodology underestimates rather than overestimates the mass

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[34] 50 Fed.Reg. 29,080.

[35] CMA's December 23, 1985 Comments on EPA's July 17, 1985 and October 11, 1985 Notices of Availability of New Information for the Organic Chemicals, Plastics and Synthetic Fibers Category at V-70, *reprinted in* Joint App. at 1078.

of pollutant discharged. Nevertheless, having failed to object to the EPA's methodology when it could easily have been changed, CMA cannot object now.[36]

Even apart from considerations of the timing of CMA's objections, we note that the EPA has presented an elaborate justification of its methodology. The EPA argues that the method it employed is statistically reasonable, and that because it is merely an averaging technique—whether "weighted" or not—its use did not prejudice CMA. We see no reason to alter our conclusion that the EPA's methodology was within its broad discretion in the choice of statistical techniques.[37]

B. The Effects of Dilution on the Measurement of Plant Performances

In its original Petition for Review, CMA argued that the influent streams of five of the forty plants in the BAT data base contained water that did not derive from OCPSF processes, and that this resulted in unduly low effluent-concentration measurements and BAT limitations.[38] We rejected this argument, deferring to the EPA's determination that the dilution identified by CMA had no significant effect on the measurement of treatment performance because it occurred before influent sampling.[39] CMA now argues that this court misconceived the importance of dilution, and recasts its argument as follows:

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[36] *See, e.g., Campos-Guardado v. INS*, 809 F.2d 285, 291 (5th Cir.), *cert. denied*, ___ U.S. ___, 108 S.Ct. 92, 98 L.Ed.2d 53 (1987); *Brotherhood of Railway, Airline, & Steamship Clerks v. St. Louis Southwestern Ry.*, 676 F.2d 132, 136 (5th Cir.1982); *Myron v. Martin*, 670 F.2d 49, 51 (5th Cir.1982); *Reynolds Metals Co. v. EPA*, 760 F.2d 549, 563 (4th Cir.1985); *Association of Pacific Fisheries v. EPA*, 615 F.2d 794, 817 (9th Cir.1980).

[37] *See* 870 F.2d at 228.

[38] *See id.* at 233.

[39] *Id.* at 234.

> Suppose, for example, that one liter of organic chemical wastewater influent to a treatment plant (Stream A) contains ten grams of pollutant X, and the plant achieves 80 percent removal. The resulting effluent will contain *two* grams per liter. Now if the original 10 grams/liter wastewater were *diluted* prior to treatment by another liter of water (Stream B) (not containing pollutant X), then the two liters of combined influent will have a measured concentration of 5 grams per liter. . . . After treatment at the same 80 percent removal rate, the combined effluent will not measure *one* gram per liter. The dilution has had no effect on treatment performance as measured by percent removal. But dilution has had the effect of making the treated effluent *concentration* in Stream A appear to be much lower than it really is—in this case by 50 percent. Yet in this example, it is the lower one gram/liter measurement that EPA used to develop the guideline limit.

Although CMA's argument initially seems plausible, it is based on the premise that BAT achieves the same percentage removal (80% in CMA's example) regardless of the influent concentration, and that the concentration in an undiluted influent cannot be reduced to the same concentration at the end of the stream as the concentration in a diluted influent. The record does not establish this premise.

It is probably true that the EPA's decision not to modify its sampling data to take account of dilution resulted in BAT limitations somewhat lower than if dilution had been taken into account. The EPA measured the influent of a plant, however, at a point downstream of the place where dilution, if any, occurred. As a result, modifying its data to take account of dilution as CMA proposes would have forced the EPA to treat data from identical processing systems operating upon identical influent streams differ-

ently depending upon whether the influent streams were "natural" or "diluted." We see no reason to conclude that the EPA was rationally required to treat a wastestream that had been diluted before it was measured differently from a wastestream that came directly from a processing plant without being diluted so long as the streams, when measured, measured the same. The EPA's refusal to adopt this course, we conclude, was rational and within its discretion. In addition, the record shows that, despite the dilution complained of by CMA, the influent pollutant concentrations at most of the five plants it identifies[40] appear to be well above the industry average for the relevant pollutants.[41]

C. The Calculation of Variability Factors From Less Than 100% of the Data

To develop the BAT limits the EPA multiplied the long-term average performance of the plants in the data base by a variability factor. The EPA calculated the variability factors by excluding daily data representing the 1% highest discharges and monthly data representing the 5% highest discharges.[42] Petitioners PPG and Dow urge, as they argued in their earlier briefs, that the BAT limitations are not achievable because these data were excluded.

In our original opinion, we held that the EPA had reasonably excluded data points exceeding the 99th and 95th percentiles because the EPA could reasonably assume that these points were isolated and extreme departures from average performance that were due to quality-control problems or upsets.[43] PPG and Dow argue, however, that the EPA had already excluded data representing quality-con-

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[40] Plants 2313, 725, 2394, 1293, and 1494.

[41] *See* Dev. Doc. V-105-07, *reprinted in* Joint App. 3646-48; Admin.R. 115331-764, *reprinted in* Joint App. 5219-424.

[42] *See* 870 F.2d at 228-29.

[43] *See id.* at 230.

trol problems and upsets from the data base. The remaining 1% and 5% instances of deviation, in their view, therefore must occur during normal operations, and should have been used in the calculation of the variability factors.

The record does not support the petitioners' contention that all individual data points (as distinguished from individual data sets) that might have resulted from upsets and quality-control problems were deleted from the data base. The record states:

> In general, the Agency's BAT toxic pollutant data base editing criteria were as follows: . . . Data not representative of BAT technology performance were eliminated from the data base. Examples of reasons for not being representative of BAT technology performance include process spills; treatment system upsets; equipment malfunctions; performance not up to design specifications; past historical performance; or performance exhibited by other plants in the data base with BAT technology in place.[44]

The EPA also asserted that "[t]he data were reviewed in detail and edited to assure that only data representing BAT-level design and operation were retained for purposes of developing limitations."[45] The EPA edited from the data base the entire data sets from plants that generally failed to conform to BAT standards; however, it did not use its editing criteria to exclude individual data points.[46] Indeed, because the detailed day-to-day operating conditions of the data-base plants were known only to the plant operators and not to the EPA,[47] it would have been impossible in most instances for the EPA to determine the reasons for an unusually high discharge.

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[44] Dev.Doc. VII-183, 185, *reprinted in* Joint App. 3883, 3885.

[45] 52 Fed.Reg. 42,540.

[46] *See* Dev.Doc. VII-189-90, *reprinted in* Joint App. 3889-90.

[47] Admin.R. 103216 n. *, *reprinted in* Joint App. at 2987 n.*.

The EPA's editing criteria were designed to select a representative group of well-operated plants utilizing BAT technology, but even well-operated plants occasionally will experience quality-control problems. The EPA therefore reasonably could assume that the individual data points representing the most extreme departures from normal operation were caused by quality-control problems that either were unlikely to recur or might be overcome by more efficient operation, and, in its discretion, the EPA could exclude them in calculating the variability factors. This conclusion is reinforced, moreover, by the fact that the EPA identified specific quality-control measures that could be used to reduce the extreme variability reported by some of the data base plants.[48]

D. The Achievability of the BAT Limitations for Volatile Pollutants Based on Steam-Stripper Technology

PPG and Dow object to both of our holdings rejecting their challenge to the BAT limitations for volatile pollutants based on steam stripper technology.[49] First, they complain that we wrongly held that the EPA reasonably excluded the 85 ppb highest discharge from plant 415 from its data base in developing the BAT limitations for trichlorethylene (TCE). The exclusion of this discharge, they contend, makes the EPA's BAT daily limit of 69 ppb for TCE unachievable. Second, Dow and PPG object to our holding that the EPA can determine the "best" plant for the development of BAT limitations on a pollutant-by-pollutant basis without demonstrating that any single plant meets the limits for all of the pollutants in its effluent.

With respect to the first issue, we conclude, as we stated in our previous opinion, that the EPA reasonably could infer that the isolated 85 ppg discharge was due either to an upset or to a quality-control problem. Because the data

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[48] *See* 52 Fed.Reg. 42,564.

[49] *See* 870 F.2d at 238-39.

concerning the cause of an unusually high discharge often will be uniquely within a plant operator's control, and because the EPA has considerable expertise in interpreting sampling data, we do not believe that the EPA's exclusion of the isolated and extremely high discharge was unreasonable.

We also reaffirm our holding that the EPA may determine the "best" plant upon which to base BAT limitations on a pollutant-by-pollutant basis. The fragments of legislative history that the petitioners quote to us are out of context and do not address the point at issue. The Fourth Circuit's decision in *Tanners' Council of America v. Train*[50] does hold that EPA limitations had not been shown to be achievable when the plants in the data base had met "the limitations for some, but not all of the pollution parameters."[51] That court's rationale was unclear, however, and we have declined to follow its decision. *Association of Pacific Fisheries v. EPA*[52] and *CPC International, Inc. v. Train*,[53] also relied on by PPG and Dow, are not contrary to this court's ruling. In *CPC International* the EPA's regulations were remanded because they were not supported by data from any plant,[54] and in *Pacific Fisheries*, a regulation was remanded because the study upon which the EPA relied did not demonstrate that the sole database plant could comply with the regulations.[55] Here, in contrast, at least one plant can meet every BAT limitation, and, as we held originally, the fact that no plant has been shown to be able to meet all of the limitations does not demonstrate that all the limitations are not achievable.

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[50] 540 F.2d 1188 (4th Cir.1976).

[51] *Id.* at 1192-94.

[52] 615 F.2d 794 (9th Cir.1980).

[53] 540 F.2d 1329 (8th Cir.1976).

[54] *See id.* at 1338-40.

[55] *See* 615 F.2d at 819.

E. The Achievability of the BAT Limitations for Priority Pollutants for Which In-Plant Biological Treatment is the Model Technology

The EPA designated in-plant biological treatment as the model technology for the treatment of twenty priority pollutants. To establish the BAT_2 limitations for these pollutants, however, the EPA relied on a data base consisting solely of three end-of-pipe biological treatment plants.[56] As a result, CMA argues, the EPA has failed to demonstrate that the BAT_2 limits for the priority pollutants are achievable.

We initially rejected CMA's argument, stating:

> [t]he petitioners have failed to demonstrate that end-of-pipe biological treatment systems are sufficiently different from in-plant systems to make the EPA's reliance on end-of-pipe data irrational. For all we can tell from the parts of the record that have been cited, the only difference between the two systems is that they are installed at different positions in the production process.[57]

CMA has now clarified its position. End-of-pipe systems, CMA points out, typically employ much longer detention times than in-plant systems. Indeed, the record shows that the three end-of-pipe plants used to develop the BAT_2 limitations for the priority pollutants—Plants 1293T, 948F, and 2536T—had detention times of 17.2, 3.5, and 1.6 days respectively. In contrast, the EPA used a maximum detention time of 2.1 days to estimate the costs of in-plant treatment systems, a period substantially shorter than the detention times at two of the three end-of-pipe plants. Because detention time is a key variable determining the effectiveness of biological treatment, CMA asserts that the

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[56] *See* 870 F.2d at 240.

[57] *Id.* at 240.

achievability of the BAT_2 limitations for the priority pollutants, which the CWA requires the EPA to demonstrate,[58] has not been established.

The EPA justifies its use of data from the three end-of-pipe plants on the grounds that end-of-pipe and in-plant systems utilize the same biological processes and the three plants treated wastestreams comparable to those that would enter an in-plant treatment system.[59] It does not follow, however, that the differing detention times can rationally be ignored; if anything, these similarities suggest that the differences in detention times are unlikely to be compensated for by an offsetting variable.

The EPA further maintains that CMA's focus on detention time is inappropriate because detention time is only one of many factors that affect the efficacy of a biological treatment system. Other factors include the organic loading of biodegradable material in the influent, the concentration of biodegrading organisms in the aeration basin (MLVSS), and the length of time that these organisms remain in the aeration basin. The EPA adds that some plants treat priority pollutants successfully even with detention times less than thirty hours, and that increasing MLVSS concentrations can shorten the time necessary for successful treatment.

Nevertheless, the record contains no performance data for in-plant treatment of the twenty priority pollutants at issue, and the EPA concedes that detention time does affect the efficacy of a treatment system. Although the record supports the EPA's assertion that higher MLVSS concentrations decrease the detention time necessary for a given level of treatment, it does not make clear exactly what level of pollution would result from any given combination of shorter detention time and increased MLVSS.

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[58] *See* 33 U.S.C. § 1314(b)(2) (1982).

[59] Dev.Doc. VII-49, *reprinted in* Joint App. at 3749.

The EPA's claim that the BAT_2 limitations can be met because MLVSS concentrations can be increased consequently appears to be no more than an educated guess.

The EPA bears the burden of producing a reasonable basis on the record for its regulations.[60] The EPA has failed, however, to demonstrate a reasonable basis for its conclusion that in-plant treatment can eliminate pollutants as effectively as the end-of-pipe systems of Plants 1293T and 948F. The limitations based on these plants therefore are arbitrary and capricious, and must be remanded to the EPA for further rulemaking proceedings. The portions of our previous opinion to the contrary are withdrawn.

F. The EPA's Erroneous Inclusion of Three Complexed Metals in the Limits for Uncomplexed Metals

Appendix A of the effluent limitations establishes limits for the discharge of toxic uncomplexed metals. Appendix B lists "complexed metals," that is metals bonded with an organic molecule, and provides that limits for such pollutants will be established on a case-by-case basis by the individual NPDES permit writer.[61] In its initial brief DuPont contended that the EPA erroneously included three complexed metals, including tetraethyl lead, tetramethyl lead, and anti-knock fuel additives, in Appendix A. DuPont contended that these compounds should have been listed in Appendix B with other complexed metals. In its rehearing petition DuPont notes that this Court failed to address this issue.

By notice filed May 12, 1989, the EPA conceded that these three compounds are complexed metals and it erred

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[60] *See Pacific Fisheries*, 615 F.2d at 819, *E.I. du Pont de Nemours & Co. v. Train*, 541 F.2d 1018, 1037-38 (4th Cir.1976), *rev'd in part on other grounds*, 430 U.S. 112, 97 S.Ct. 965, 51 L.Ed.2d 204 (1977); *CPC Int'l*, 540 F.2d at 1338-40; *FMC Corp v. Train*, 539 F.2d 973, 981-82 (4th Cir.1976); *American Iron & Steel Inst. v. EPA*, 526 F.2d 1027, 1062-63, 1065 (3d Cir.1975).

[61] 52 Fed.Reg. 42,542-43.

by including them in Appendix A. This Court therefore grants the petition for review, strikes these three compounds from Appendix A, and remands the issue to the Administrator for further rulemaking proceedings.

Conclusion

The petitioners' request for a rehearing is denied in all respects except that 1) our previous opinion is clarified as explained above; 2) the limitations for priority pollutants for which in-plant biological treatment is the model technology are remanded to the EPA for further rulemaking proceedings insofar as they are based on Plants 1293T and 948F; and 3) the three complexed metals erroneously included in Appendix A are ordered stricken from that Appendix, and the issue is remanded to the Administrator for further rulemaking proceedings.

APPENDIX B

THE CLEAN WATER ACT

§ 1311. Effluent limitations

(a) Illegality of pollutant discharges except in compliance with law

Except as in compliance with this section and sections 1312, 1316, 1317, 1328, 1342, and 1344 of this title, the discharge of any pollutant by any person shall be unlawful.

(b) Timetable for achievement of objectives

In order to carry out the objective of this chapter there shall be achieved—

(1)(A) not later than July 1, 1977, effluent limitations for point sources, other than publicly owned treatment works, (i) which shall require the application of the best practicable control technology currently available as defined by the Administrator pursuant to section 1314(b) of this title, or (ii) in the case of a discharge into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, which shall require compliance with any applicable pretreatment requirements and any requirements under section 1317 of this title; and

(B) for publicly owned treatment works in existence on July 1, 1977, or approved pursuant to section 1283 of this title prior to June 30, 1976 (for which construction must be completed within four years of approval), effluent limitations based upon secondary treatment as defined by the Administrator pursuant to section 1314(d)(1) of this title; or,

(C) not later than July 1, 1977, any more stringent limitation, including those necessary to meet water

quality standards, treatment standards, or schedules of compliance, established pursuant to any State law or regulations (under authority preserved by section 1370 of this title) or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to this chapter.

(2)(A) for pollutants identified in subparagraphs (C), (D), and (F) of this paragraph, effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which (i) shall require application of the best available technology economically achievable for such category or class, which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants, as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(2) of this title, which such effluent limitations shall require the elimination of discharges of all pollutants if the Administrator finds, on the basis of information available to him (including information developed pursuant to section 1325 of this title), that such elimination is technologically and economically achievable for a category or class of point sources as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(2) of this title, or (ii) in the case of the introduction of a pollutant into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, shall require compliance with any applicable pretreatment requirements and any other requirement under section 1317 of this title;

(B) Repealed. Pub.L. 97-117, §§ 21(b), Dec. 29, 1981, 95 Stat. 1632.

(C) not later than July 1, 1984, with respect to all toxic pollutants referred to in table 1 of Committee Print Numbered 95-30 of the Committee on Public

Works and Transportation of the House of Representatives compliance with effluent limitations in accordance with subparagraph (A) of this paragraph;

(D) for all toxic pollutants listed under paragraph (1) of subsection (a) of section 1317 of this title which are not referred to in subparagraph (C) of this paragraph compliance with effluent limitations in accordance with subparagraph (A) of this paragraph not later than three years after the date such limitations are established;

(E) not later than July 1, 1984, effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which in the case of pollutants identified pursuant to section 1314(a)(4) of this title shall require application of the best conventional pollutant control technology as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(4) of this title; and

(F) for all pollutants (other than those subject to subparagraphs (C), (D), or (E) of this paragraph) compliance with effluent limitations in accordance with subparagraph (A) of this paragraph not later than 3 years after the date such limitations are established, or not later than July 1, 1984, whichever is later, but in no case later than July 1, 1987.

* * *

§ 1314 Information and Guidelines

(b) Effluent limitation guidelines

For the purpose of adopting or revising effluent limitations under this chapter the Administrator shall, after consultation with appropriate Federal and State agencies and other interested persons, publish within one year of October 18, 1972, regulations, providing guidelines for effluent limitations, and, at least annually thereafter, revise, if appropriate, such regulations. Such regulations shall—

(1)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best practicable control technology currently available for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the control measures and practices to be applicable to point sources (other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best practicable control technology currently available to comply with subsection (b)(1) of section 1311 of this title shall include consideration of the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application, and shall also take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate;

(2)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics

of pollutants, the degree of effluent reduction attainable through the application of the best control measures and practices achievable including treatment techniques, process and procedure innovations, operating methods, and other alternatives for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the best measures and practices available to comply with subsection (b)(2) of section 1311 of this title to be applicable to any point source (other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best available technology shall take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate;

(3) identify control measures and practices available to eliminate the discharge of pollutants from categories and classes of point sources, taking into account the cost of achieving such elimination of the discharge of pollutants; and

(4)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best conventional pollutant control technology (including measures and practices) for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the best conventional pollutant control technology measures and practices to comply with section

1311(b)(2)(E) of this title to be applicable to any point source (other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best conventional pollutant control technology (including measures and practices) shall include consideration of the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived, and the comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources, and shall take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate.

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APPENDIX C

40 C.F.R. PART 414—ORGANIC CHEMICALS, PLASTICS, AND SYNTHETIC FIBERS

Subpart A—General

§ 414.10 General definitions.

As used in this part:

(a) Except as provided in this regulation, the general definitions, abbreviations and methods of analysis set forth in Part 401 of this chapter shall apply to this part.

(b) "Pretreatment control authority" means:

(1) The POTW if the POTW's submission for its pretreatment program has been approved in accordance with the requirements of 40 CFR 403.11, or

(2) The Approval Authority if the submission has not been approved.

(c) "Priority pollutants" means the toxic pollutants listed in 40 CFR 401.15.

§ 414.11 Applicability.

(a) The provisions of this part are applicable to process wastewater discharges from all establishments or portions of establishments that manufacture the organic chemicals, plastics, and synthetic fibers (OCPSF) products or product groups covered by Subparts B through H of this regulation and are included within the following U.S. Department of Commerce Bureau of the Census Standard Industrial Classification (SIC) major groups:

(1) SIC 2821—Plastic Materials, Synthetic Resins, and Nonvulcanizable Elastomers,

(2) SIC 2823—Cellulosic Man-Made Fibers,

(3) SIC 2824—Synthetic Organic Fibers, Except Cellulosic,

(4) SIC 2865—Cyclic Crudes and Intermediates, Dyes, and Organic Pigments,

(5) SIC 2869—Industrial Organic Chemicals, Not Elsewhere Classified.

(b) The provisions of this part are applicable to wastewater discharges from OCPSF research and development, pilot plant, technical service and laboratory bench scale operations if such operations are conducted in conjunction with and related to existing OCPSF manufacturing activities at the plant site.

(c) Notwithstanding paragraph (a) of this section, the provisions of this part are not applicable to discharges resulting from the manufacture of OCPSF products if the products are included in the following SIC subgroups and have in the past been reported by the establishment under these subgroups and not under the SIC groups listed in paragraph (a) of this section:

(1) SIC 2843085—bulk surface active agents;

(2) SIC 28914—synthetic resin and rubber adhesives;

(3) Chemicals and Chemical Preparations, not Elsewhere Classified:

(i) SIC 2899568—sizes, all types

(ii) SIC 2899597—other industrial chemical specialties, including fluxes, plastic wood preparations, and embalming fluids;

(4) SIC 2911058—aromatic hydrocarbons manufactured from purchased refinery products; and

(5) SIC 2911632—aliphatic hydrocarbons manufactured from purchased refinery products.

(d) Notwithstanding paragraph (a) of this section, the provisions of this part are not applicable to any discharges

for which a different set of previously promulgated effluent limitations guidelines and standards in this subchapter apply, unless the facility reports OCPSF products under SIC codes 2865, 2869, or 2821, and the facility's OCPSF wastewaters are treated in a separate treatment system or discharged separately to a publicly owned treatment works.

(e) The provisions of this part do not apply to any process wastewater discharges from the manufacture of organic chemical compounds solely by extraction from plant and animal raw materials or by fermentation processes.

(f) Discharges of chromium, copper, lead, nickel, and zinc in "complexed metal-bearing waste streams," listed in Appendix B of this part, are not subject to the requirements of this part.

§ 414.12 Compliance date for Pretreatment Standards for Existing Sources (PSES).

All dischargers subject to PSES in this part must comply with the standards by no later than three years after date of promulgation in the FEDERAL REGISTER.

Subpart B—Rayon Fibers

§ 414.20 Applicability; description of the rayon fibers subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from the manufacture of rayon fiber by the viscose process only.

§ 414.21 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve discharges not exceeding the quantity (mass) de-

termined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

Effluent characteristics	BPT effluent limitations [1]	
	Maximum for any one day	Maximum for monthly average
BOD5	64	24
TSS	130	40
pH	(2)	(2)

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.22 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

§ 414.23 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) The Agency has determined that for existing point sources whose total OCPSF production defined by § 414.11 is less than or equal to five (5) million pounds of OCPSF products per year, the BPT level of treatment is the best available technology economically achievable. Accordingly, the Agency is not promulgating more stringent BAT limitations for these point sources.

(b) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part.

(c) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point

source that does not use end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.101 of this part.

§ 414.24 New source performance standards (NSPS).

(a) Any new source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) Any new source that does not use end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.101 of this part and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

Effluent characteristics	NSPS [1] Maximum for any one day	NSPS [1] Maximum for monthly average
BOD5	64	24
TSS	130	40
pH	(2)	(2)

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.25 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly-owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the following table for the metal pollutants times the flow from metal-bearing waste streams for metals and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metals or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and

(2) That the combination of such streams, prior to treatment, with the Appendix A waste streams would result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent characteristics	Pretreatment standards [1]	
	Maximum for any one day	Maximum for monthly average
Acenaphthene	47	19
Benzene	1[illegible]	57
Carbon Tetrachloride	380	142
Chlorobenzene	380	142
1,2,4-Trichlorobenzene	794	196
Hexachlorobenzene	794	196
1,2-Dichloroethane	574	180
1,1,1-Trichloroethane	59	22
Hexachloroethane	794	196
1,1-Dichloroethane	59	22
1,1,2-Trichloroethane	127	32
Chloroethane	295	110

Chloroform	325	111
1,2-Dichlorobenzene	794	196
1,3-Dichlorobenzene	380	142
1,4-Dichlorobenzene	380	142
1,1-Dichloroethylene	60	22
1,2-Trans-dichloroethylene	66	25
1,2-Dichloropropane	794	196
1,3-Dichloropropylene	794	196
2,4-Dimethylphenol	47	19
Ethylbenzene	380	142
Fluoranthene	54	22
Methylene Chloride	170	36
Methyl Chloride	295	110
Hexachlorobutadiene	380	142
Naphthalene	47	19
Nitrobenzene	6,402	2,237
2-Nitrophenol	231	65
4-Nitrophenol	576	162
4,6-Dinitro-o-cresol	277	78
Phenol	47	19
Bis(2-ethylhexyl)phthalate	258	95
Di-n-butyl phthalate	43	20
Diethyl phthalate	113	46
Dimethyl phthalate	47	19
Anthracene	47	19
Fluorene	47	19
Phenenthrene	47	19
Pyrene	48	20
Tetrachloroethylene	164	52
Toluene	74	28
Trichloroethylene	69	26
Vinyl Chloride	172	97
Total Cyanide	1,200	420
Total Lead	690	320
Total Zinc [2]	2,610	1,050

[1] All units are micrograms per liter.

[2] Total Zinc for Rayon Fiber Manufacture that uses the viscose process is 6,796 *u*/l and 3,325 *u*/l for maximum for any one day and maximum for monthly average, respectively.

§ 414.26 Pretreatment standards for new sources (PSNS).

(a) Except as provided in 40 CFR 403.7 any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed above in § 414.25.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed above in § 414.25 for the metal pollutants times the flow from metal-bearing waste streams and times the flow from metal-bearing waste streams and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and

(2) That the combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Subpart C—Other Fibers

§ 414.30 Applicability; description of the other fibers subcategory.

The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture

of the following SIC 2823 cellulosic man-made fibers and fiber groups, except Rayon, and SIC 2824 synthetic organic fibers and fiber groups. Product groups are indicated with an asterisk (*).

*Acrylic Fibers (85% Polyacrylonitrile)
*Cellulose Acetate Fibers
*Fluorocarbon (Teflon) Fibers
*Modacrylic Fibers
*Nylon 6 Fibers
Nylon 6 Monofiiament
*Nylon 66 Fibers
Nylon 66 Monofilament
*Polyamide Fibers (Quiana)
*Polyaramid (Kevlar) Resin-Fibers
*Polyaramid (Nomex) Resin-Fibers
*Polyester Fibers
*Polyethylene Fibers
*Polypropylene Fibers
*Polyurethane Fibers (Spandex)

§ 414.31 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve discharges not exceeding the (mass) quantity determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

Effluent characteristics	BPT effluent limitations [1]	
	Maximum for any one day	Maximum for monthly average
BOD5	48	18

TSS	115	36
pH	(2)	(2)

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.32 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

§ 414.33 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) The Agency has determined that for existing point sources whose total OCPSF production defined by § 414.11 is less than or equal to five (5) million pounds of OCPSF products per year, the BPT level of treatment is the best available technology economically achievable. Accordingly, the Agency is not promulgating more stringent BAT limitations for these point sources.

(b) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part.

(c) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that does not use end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.101 of this part.

§ 414.34 New source performance standards (NSPS).

(a) Any new source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part, and also must not exceed the quantity (mass) determined by multiplying

the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) Any new source that does not use end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.101 of this part, and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

Effluent characteristics	NSPS [1] Maximum for any one day	NSPS [1] Maximum for monthly average
BOD5	48	18
TSS	115	36
pH	([2])	([2])

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.35 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the following table for the metals pollutants times the flow from metal-bearing waste streams for metals and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this

part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent characteristics	Pretreatment standards [1]	
	Maximum for any one day	Maximum for monthly average
Acenaphthene	47	19
Benzene	134	57
Carbon Tetrachloride	380	142
Chlorobenzene	380	142
1,2,4-Trichlorobenzene	794	196
Hexachlorobenzene	794	196
1,2-Dichloroethane	574	180
1,1,1-Trichloroethane	59	22
Hexachloroethane	794	196
1,1-Dichloroethane	59	22
1,1,2-Trichloroethane	127	32
Chloroethane	295	110
Chloroform	325	111
1,2-Dichlorobenzene	794	196
1,3-Dichlorobenzene	380	142
1,4-Dichlorobenzene	380	142
1,1-Dichloroethylene	60	22
1,2-trans-Dichloroethylene	66	25
1,2-Dichloropropane	794	196
1,3-Dichloropropylene	794	196
2,4-Dimethylphenol	47	19

Ethylbenzene	380	142
Fluoranthene	54	22
Methylene Chloride	170	36
Methyl Chloride	295	110
Hexachlorobutadiene	380	142
Naphthalene	47	19
Nitrobenzene	6,402	2,237
2-Nitrophenol	231	65
4-Nitrophenol	576	162
4,6-Dinitro-o-cresol	277	78
Phenol	47	19
Bis(2-ethylhexyl)phthalate	258	95
Di-n-butyl phthalate	43	20
Diethyl phthalate	113	46
Dimethyl phthalate	47	19
Anthracene	47	19
Fluorene	47	19
Phenenthrene	47	19
Pyrene	48	20
Tetrachloroethylene	164	52
Toluene	74	28
Trichloroethylene	69	26
Vinyl Chloride	172	97
Total Cyanide	1,200	420
Total Lead	690	320
Total Zinc [2]	2,610	1,050

[1] All units are micrograms per liter.

[2] Total zinc for the manufacture of acrylic fibers using the zinc chloride/solvent process is 6,796 *u*/l and 3,325 *u*/l for maximum for any one day and maximum for monthly average, respectively.

§ 414.36 Pretreatment standards for new sources (PSNS).

(a) Except as provided in 40 CFR 403.7 any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed above in § 414.35.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed above in § 414.35 for the metal pollutants times the flow from metal-bearing waste streams for metals and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Subpart D—Thermoplastic Resins

§ 414.40 Applicability; description of the thermoplastic resins subcategory.

The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture of the following SIC 28213 thermoplastic resins and thermoplastic resin groups. Product groups are indicated with an asterisk (*).

*Abietic Acid—Derivatives
*ABS Resins
*ABS-SAN Resins
*Acrylate-Methacrylate Latexes
*Acrylic Latex
*Acrylic Resins
*Cellulose Acetate Butyrates

Cellulose Acetate Resin
*Cellulose Acetates
*Cellulose Acetates Propionates
Cellulose Nitrate
Cellulose Sponge
*Ethylene-Methacrylic Acid Copolymers
*Ethylene-Vinyl Acetate Copolymers
*Fatty Acid Resins
*Fluorocarbon Polymers
Nylon 11 Resin
*Nylon 6—66 Copolymers
*Nylon 6—Nylon 11 Blends
Nylon 6 Resin
Nylon 612 Resin
Nylon 66 Resin
*Nylons
*Petroleum Hydrocarbon Resins
*Polyvinyl Pyrrolidone—Copolymers
*Poly(Alpha)Olefins
Polyacrylic Acid
*Polyamides
*Polyarylamides
Polybutadiene
*Polybutenes
Polybutenyl Succinic Anhydride
*Polycarbonates
*Polyester Resins
*Polyester Resins, Polybutylene Terephthalate
*Polyester Resins, Polyoxybenzoate
Polyethylene
*Polyethylene—Ethyl Acrylate Resins
*Polyethylene—Polyvinyl Acetate Copolymers
Polyethylene Resin (HDPE)
Polyethylene Resin (LPDE)
Polyethylene Resin, Scrap
Polyethylene Resin, Wax (Low M.W.)
Polyethylene Resin, Latex

Polyethylene Resins
*Polyethylene Resins, Compounded
*Polyethylene, Chlorinated
*Polyimides
*Polypropylene Resins
Polystyrene (Crystal)
Polystyrene (Crystal) Modified
*Polystyrene—Copolymers
*Polystyrene—Acrylic Latexes
Polystyrene Impact Resins
Polystyrene Latex
Polystyrene, Expandable
Polystyrene, Expanded
*Polysulfone Resins
Polyvinyl Acetate
*Polyvinyl Acetate—PVC Copolymers
*Polyvinyl Acetate Copolymers
*Polyvinyl Acetate Resins
Polyvinyl Alcohol Resin
Polyvinyl Chloride
Polyvinyl Chloride, Chlorinated
*Polyvinyl Ether-Maleic Anhydride
*Polyvinyl Formal Resins
*Polyvinylacetate—Methacrylic Copolymers
*Polyvinylacetate Acrylic Copolymers
*Polyvinylacetate-2-Ethylhexylacrylate Copolymers
Polyvinylidene Chloride
*Polyvinylidene Chloride Copolymers
*Polyvinylidene-Vinyl Chloride Resins
*PVC Copolymers, Acrylates (Latex)
*PVC Copolymers, Ethylene-Vinyl Chloride
*Rosin Derivative Resins
*Rosin Modified Resins
*Rosin Resins
*SAN Resins
*Silicones: Silicone Resins
*Silicones: Silicone Rubbers

*Styrene Maleic Anhydride Resins
Styrene Polymeric Residue
*Styrene-Acrylic Copolymer Resins
*Styrene-Acrylonitrile-Acrylates Copolymers
*Styrene-Butadiene Resins
*Styrene-Butadiene Resins (<50% Butadiene)
*Styrene-Butadiene Resins (latex)
*Styrene-Divinyl Benzene Resins (Ion Exchange)
*Styrene-Methyl Methacrylate Copolymers
*Styrene, Butadiene, Vinyl Toluene Terpolymers
*Sulfonated Styrene-Maleic Anhydride Resins
*Unsaturated Polyester Resins
*Vinyl Toluene Resins
*Vinyl Toluene-Acrylate Resins
*Vinyl Toluene-Butadiene Resins
*Vinyl Toluene-Methacrylate Resins
*Vinylacetate-N-Butylacrylate Copolymers

§ 414.41 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

Effluent characteristics	BPT Effluent Limitations [1]	
	Maximum for any one day	Maximum for monthly average
BOD5	64	24
TSS	130	40
pH	([2])	([2])

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.42 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

§ 414.43 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) The Agency has determined that for existing point sources whose total OCPSF production defined by § 414.11 is less than or equal to five (5) million pounds of OCPSF products per year, the BPT level of treatment is the best available technology economically achievable. Accordingly, the Agency is not promulgating more stringent BAT limitations for these point sources.

(b) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part.

(c) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that does not use end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.101 of this part.

§ 414.44 New source performance standards (NSPS).

(a) Any new source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part, and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) Any new source that does not use end-of-pipe biological treatment and is subject to this subpart must

achieve discharges in accordance with § 414.101 of this part, and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

Effluent characteristics	NSPS [1] Maximum for any one day	NSPS [1] Maximum for monthly average
BOD5	64	24
TSS	130	40
pH	[2]	[2]

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.45 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the following table for the metal pollutants times the flow from metal-bearing waste streams for metals and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metals or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams would result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent characteristics	Pretreatment standards [1]	
	Maximum for any one day	Maximum for monthly average
Acenaphthene	47	19
Benzene	134	57
Carbon Tetrachloride	380	142
Chlorobenzene	380	142
1,2,4-Trichlorobenzene	794	196
Hexachlorobenzene	794	196
1,2-Dichloroethane	574	180
1,1,1-Trichloroethane	59	22
Hexachloroethane	794	196
1,1-Dichloroethane	59	22
1,1,2-Trichloroethane	127	32
Chloroethane	295	110
Chloroform	325	111
1,2-Dichlorobenzene	794	196
1,3-Dichlorobenzene	380	142
1,4-Dichlorobenzene	380	142
1,1-Dichloroethylene	60	22
1,2-trans-Dichloroethylene	66	25
1,2-Dichloropropane	794	196
1,3-Dichloropropylene	794	196
2,4-Dimethylphenol	47	19
Ethylbenzene	380	142
Fluoranthene	54	22
Methylene Chloride	170	36
Methyl Chloride	295	110

Hexachlorobutadiene	380	142
Naphthalene	47	19
Nitrobenzene	6,402	2,237
2-Nitrophenol	231	65
4-Nitrophenol	576	162
4,6-Dinitro-o-cresol	277	78
Phenol	47	19
Bis(2-ethylhexyl)phthalate	258	95
Di-n-butyl phthalate	43	20
Diethyl phthalate	113	46
Dimethyl phthalate	47	19
Anthracene	47	19
Fluorene	47	19
Phenenthrene	47	19
Pyrene	48	20
Tetrachloroethylene	164	52
Toluene	74	28
Trichloroethylene	69	26
Vinyl Chloride	172	97
Total Cyanide	1,200	420
Total Lead	690	320
Total Zinc	2,610	1,050

[1] All units are micrograms per liter.

§ 414.46 Pretreatment standards for new sources (PSNS).

(a) Except as provided in 40 CFR 403.7 any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed above in § 414.45.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed above in § 414.45 for the metal pollutants times the flow from metal-bearing waste streams and times the flow from metal-bearing waste streams and times the flow from the cyanide-bearing waste streams for

total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Subpart E—Thermosetting Resins

§ 414.50 Applicability; description of the thermosetting resins subcategory.

The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture of the following SIC 28214 thermosetting resins and thermosetting resin groups. Product groups are indicated with an asterisk (*).

*Alkyd Resins
Dicyanodiamide Resin
*Epoxy Resins
*Fumaric Acid Polyesters
*Furan Resins
Glyoxal-Urea Formaldehyde Textile Resin
*Ketone-Formaldehyde Resins
*Melamine Resins
*Phenolic Resins
*Polyacetal Resins
Polyacrylamide
*Polyurethane Prepolymers

*Polyurethane Resins
*Urea Formaldehyde Resins
*Urea Resins

§ 414.51 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve discharges not exceeding the (mass) quantity determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

Effluent characteristics	BPT effluent limitations [1]	
	Maximum for any one day	Maximum for monthly average
BOD5	163	61
TSS	216	67
pH	(2)	(2)

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.52 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

§ 414.53 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) The Agency has determined that for existing point sources whose total OCPSF production defined by § 414.11 is less than or equal to five (5) million pounds of OCPSF

products per year, the BPT level of treatment is the best available technology economically achievable. Accordingly, the Agency is not promulgating more stringent BAT limitations for these point sources.

(b) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part.

(c) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that does not use end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.101 of this part.

§ 414.54 New source performance standards (NSPS).

(a) Any new source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part, and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) Any new source that does not use end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.101 of this part, and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

Effluent characteristics	NSPS [1] Maximum for any one day	NSPS [1] Maximum for monthly average
BOD5	163	61
TSS	216	67

pH	(2)	(2)

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.55 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the following table for the metal pollutants times the flow from metal-bearing waste streams for metals and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent characteristics	Pretreatment standards [1]	
	Maximum for any one day	Maximum for monthly average
Acenaphthene	47	19
Benzene	134	57
Carbon Tetrachloride	380	142
Chlorobenzene	380	142
1,2,4-Trichlorobenzene	794	196
Hexachlorobenzene	794	196
1,2-Dichloroethane	574	180
1,1,1-Trichloroethane	59	22
Hexachloroethane	794	196
1,1-Dichloroethane	59	22
1,1,2-Trichloroethane	127	32
Chloroethane	295	110
Chloroform	325	111
1,2-Dichlorobenzene	794	196
1,3-Dichlorobenzene	380	142
1,4-Dichlorobenzene	380	142
1,1-Dichloroethylene	60	22
1,2-Trans-Dichloroethylene	66	25
1,2-Dichloropropane	794	196
1,3-Dichloropropylene	794	196
2,4-Dimethylphenol	47	19
Ethylbenzene	380	142
Fluoranthene	54	22
Methylene Chloride	170	36
Methyl Chloride	295	110
Hexachlorobutadiene	380	142
Naphthalene	47	19
Nitrobenzene	6,402	2,237
2-Nitrophenol	231	65
4-Nitrophenol	576	162
4,6-Dinitro-o-cresol	277	78
Phenol	47	19
Bis(2-ethylhexyl)phthalate	258	95
Di-n-butyl phthalate	43	20
Diethyl phthalate	113	46

Dimethyl phthalate	47	19
Anthracene	47	19
Fluorene	47	19
Phenanthrene	47	19
Pyrene	48	20
Tetrachloroethylene	164	52
Toluene	74	28
Trichloroethylene	69	26
Vinyl Chloride	172	97
Total Cyanide	1,200	420
Total Lead	690	320
Total Zinc	2,610	1,050

[1] All units are milligrams per liter.

§ 414.56 Pretreatment standards for new sources (PSNS).

(a) Except as provided in 40 CFR 403.7 any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed above in § 414.55.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed above in § 414.55 for the metal pollutants times the flow from metal-bearing waste streams for metals and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Subpart F—Commodity Organic Chemicals

§ 414.60 Applicability; description of the commodity organic chemicals subcategory.

The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture of the following SIC 2865 and 2869 commodity organic chemicals and commodity organic chemical groups. Product groups are indicated with an asterisk (*).

(a) Aliphatic Organic Chemicals

Acetaldehyde
Acetic Acid
Acetic Anhydride
Acetone
Acrylonitrile
Adipic Acid
*Butylenes (Butenes)
Cyclohexane
Ethanol
Ethylene
Ethylene Glycol
Ethylene Oxide
Formaldehyde
Isopropanol
Methanol
Polyoxypropylene Glycol
Propylene
Propylene Oxide
Vinyl Acetate
1,2-Dichloroethane
1,3-Butadiene

(b) Aromatic Organic Chemicals

Benzene
Cumene
Dimethyl Terephthalate
Ethylbenzene
m-Xylene (impure)
p-Xylene
Phenol
*Pitch Tar Residues
*Pyrolysis Gasolines
Styrene
Terephthalic Acid
Toluene
*Xylenes, Mixed
o-Xylene

(c) Halogenated Organic Chemicals

Vinyl Chloride

§ 414.61 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve discharges not exceeding the (mass) quantity determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

Effluent characteristics	BPT Effluent limitations [1]	
	Maximum for any one day	Maximum for monthly average
BOD5	80	30
TSS	149	46

pH	(2)	(2)

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.62 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

§ 414.63 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) The Agency has determined that for existing point sources whose total OCPSF production defined by § 414.11 is less than or equal to five (5) million pounds of OCPSF products per year, the BPT level of treatment is the best available technology economically achievable. Accordingly, the Agency is not promulgating more stringent BAT limitations for these point sources.

(b) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part.

(c) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that does not use end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.101 of this part.

§ 414.64 New source performance standards (NSPS).

(a) Any new source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part, and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) Any new source that does not use end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.101 of this part, and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

Effluent characteristics	NSPS [1] Maximum for any one day	NSPS [1] Maximum for monthly average
BOD5	80	30
TSS	149	46
pH	([2])	([2])

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.65 Pretreatment standards for existing sources (PSES).

(a)Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the following table for the metal pollutants times the flow from metal-bearing waste streams for metals and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams iden-

tified by the control authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent characteristics	Pretreatment standards [1]	
	Maximum for any one day	Maximum for monthly average
Acenaphthene	47	19
Benzene	134	57
Carbon Tetrachloride	380	142
Chlorobenzene	380	142
1,2,4-Trichlorobenzene	794	196
Hexachlorobenzene	794	196
1,2-Dichloroethane	574	180
1,1,1-Trichloroethane	59	22
Hexachloroethane	794	196
1,1-Dichloroethane	59	22
1,1,2-Trichloroethane	127	32
Chloroethane	295	110
Chloroform	325	111
1,2-Dichlorobenzene	794	196
1,3-Dichlorobenzene	380	142
1,4-Dichlorobenzene	380	142
1,1-Dichloroethylene	60	22
1,2-trans-Dichloroethylene	66	25
1,2-Dichloropropane	794	196
1,3-Dichloropropylene	794	196
2,4-Dimethylphenol	47	19
Ethylbenzene	380	142

Fluoranthene	54	22
Methylene Chloride	170	36
Methyl Chloride	295	110
Hexachlorobutadiene	380	142
Naphthalene	47	19
Nitrobenzene	6,402	2,237
2-Nitrophenol	231	65
4-Nitrophenol	576	162
4,6-Dinitro-o-cresol	277	78
Phenol	47	19
Bis(2-ethylhexyl)phthalate	258	95
Di-n-butyl phthalate	43	20
Diethyl phthalate	113	46
Dimethyl phthalate	47	19
Anthracene	47	19
Fluorene	47	19
Phenenthrene	47	19
Pyrene	48	20
Tetrachloroethylene	164	52
Toluene	74	28
Toluene	74	28
Trichloroethylene	69	26
Vinyl Chloride	172	97
Total Cyanide	1,200	420
Total Lead	690	320
Total Zinc	2,610	1,050

[1] All units are milligrams per liter.

§ 414.66 Pretreatment standards for new sources (PSNS).

(a) Except as provided in 40 CFR 403.7 any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed above in § 414.65.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying

the concentrations listed above in § 414.65 for the metal pollutants times the flow from metal-bearing waste streams for metals and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Subpart G—Bulk Organic Chemicals

§ 414.70 Applicability; description of the bulk organic chemicals subcategory.

The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture of the following SIC 2865 and 2869 bulk organic chemicals and bulk organic chemical groups. Product groups are indicated with an asterisk (*).

(a) Aliphatic Organic Chemicals

*Acetic Acid Esters
*Acetic Acid Salts
Acetone Cyanohydrin
Acetylene
Acrylic Acid
*Acrylic Acid Esters
*Alkoxy Alkanols

*Alkylates
*Alpha-Olefins
Butane (all forms)
*C-4 Hydrocarbons (Unsaturated)
Calcium Stearate
Caprolactam
Carboxymethyl Cellulose
Cellulose Acetate Butyrates
*Cellulose Ethers
Citric Acid
Cumene Hydroperoxide
Cyclohexanol
Cyclohexanol, Cyclohexanone (Mixed)
Cyclohexanone
Cylohexene
*C12-C18 Primary Alcohols
*C5 Concentrates
*C9 Concentrates
Decanol
Diacetone Alcohol
*Dicarboxylic Acids—Salts
Diethyl Ether
Diethylene Glycol
Diethylene Glycol Diethyl Ether
Diethylene Glycol Dimethyl Ether
Diethylene Glycol Monoethyl Ether
Diethylene Glycol Monomethyl Ether
*Dimer Acids
Dioxane
Ethane
Ethylene Glycol Monophenyl Ether
*Ethoxylates, Misc.
Ethylene Glycol Dimethyl Ether
Ethylene Glycol Monobutyl Ether
Ethylene Glycol Monoethyl Ether
Ethylene Glycol Monomethyl Ether
*Fatty Acids

Glycerine (Synthetic)
Glyoxal
Hexane
*Hexanes and Other C6 Hydrocarbons
Isobutanol
Isobutylene
Isobutyraldehyde
Isophorone
Isophthalic Acid
Isoprene
Isopropyl Acetate
Ligninsulfonic Acid, Calcium Salt
Maleic Anhydride
Methacrylic Acid
*Methacrylic Acid Esters
Methane
Methyl Ethyl Ketone
Methyl Methacrylate
Methyl Tert-Butyl Ether
Methylisobutyl Ketone
*n-Alkanes
n-Butyl Alcohol
n-Butylacetate
n-Butyraldehyde
n-Butyric Acid
n-Butyric Anhydride
*n-Paraffins
n-Propyl Acetate
n-Propyl Alcohol
Nitrilotriacetic Acid
Nylon Salt
Oxalic Acid
*Oxo Aldehydes—Alcohols
Pentaerythritol
Pentane
*Pentenes
*Petroleum Sulfonates

Pine Oil
Polyoxybutylene Glycol
Polyoxyethylene Glycol
Propane
Propionaldehyde
Propionic Acid
Propylene Glycol
Sec-Butyl Alcohol
Sodium Formate
Sorbitol
Stearic Acid, Calcium Salt (Wax)
Tert-Butyl Alcohol
1-Butene
1-Pentene
1,4-Butanediol
Isobutyl Acetate
2-Butene (Cis and Trans)
2-Ethyl Hexanol
2-Ethylbutyraldehyde
2,2,4-Trimethyl-1,3-Pentanediol

(b) Amine and Amide Organic Chemicals

2,4-Diaminotoluene
*Alkyl Amines
Aniline
Caprolactam, Aqueous Concentrate
Diethanolamine
Diphenylamine
*Ethanolamines
Ethylamine
Ethylenediamine
Ethylenediaminetetracetic Acid
*Fatty Amines
Hexamethylene Diamine
Isopropylamine
m-Toluidine
Melamine

Melamine Crystal
*Methylamines
Methylene Dianiline
n-Butylamine
N,N-Diethylaniline
N,N-Dimethylformamide
*Nitroanilines
Polymeric Methylene Dianiline
Sec-Butylamine
Tert-Butylamine
Toluenediamine (Mixture)
*Toluidines
o-Phenylenediamine
2,6-Dimethylaniline
4-(N-Hydroxyethylethylamino)-2-Hydroxyethyl Analine
4,4'-Methylenebis (N,N'-dimethyl)-aniline
4,4'Methylenedianiline

(c) Aromatic Organic Chemicals

Alpha-Methylstyrene
*Alkyl Benzenes
*Alkyl Phenols
*Alkylbenzene Sulfonic Acids, Salts
Aminobenzoic Acid (Meta and Para)
Aspirin
Beta-Naphthalene Sulfonic Acid
Benzenedisulfonic Acid
Benzoic Acid
Bis(2-Ethylhexyl)Phthalate
Bisphenol A
BTX-Benzene, Toluene, Xylene (Mixed)
Butyl Octyl Phthalate
Coal Tar
*Coal Tar Products (Misc.)
Creosote
*Cresols, Mixed
Cyanuric Acid

*Cyclic Aromatic Sulfonates
Dibutyl Phthalate
Diisobutyl Phthalate
Diisodecyl Phthalate
Diisooctyl Phthalate
Dimethyl Phthalate
Dinitrotoluene (Mixed)
Ditridecyl Phthalate
m-Cresol
Metanilic Acid
Methylenediphenyldiisocyanate
Naphthalene
*Naphthas, Solvent
Nitrobenzene
Nitrotoluene
Nonylphenol
p-Cresol
Phthalic Acid
Phthalic Anhydride
*Tars—Pitches
Tert-Butylphenol
*Toluene Diisocyanates (Mixture)
Trimellitic Acid
o-Cresol
1-Tetralol, 1-Tetralone Mix
2,4-Dinitrotoluene
2,6-Dinitrotoluene

(d) Halogenated Organic Chemicals

1,4-Phenylenediamine Dihydrochloride
Allyl Chloride
Benzyl Chloride
Carbon Tetrachloride
*Chlorinated Paraffins, 35-64 PCT, Chlorine
Chlorobenzene
*Chlorobenzenes (Mixed)
Chlorodifluorethane

Chloroform
*Chloromethanes
2-Chloro-5-Methylphenol (6-chloro-m-cresol)
*Chlorophenols
Chloroprene
Cyanogen Chloride
Cyanuric Chloride
Dichloropropane
Epichlorohydrin
Ethyl Chloride
*Fluorocarbons (Freons)
Methyl Chloride
Methylene Chloride
Pentachlorophenol
Phosgene
Tetrachloroethylene
Trichloroethylene
Trichlorofluoromethane
Vinylidene Chloride
1,1-Dichloroethane
1,1,1-Trichloroethane
2,4-Dichlorophenol

(e) Other Organic Chemicals

Adiponitrile
Carbon Disulfide
Dithiophosphates, Sodium Salt
Fatty Nitriles
*Organo-Tin Compounds
*Phosphate Esters
Tetraethyl Lead
Tetramethyl Lead
*Urethane Prepolymers
*Waxes, Emulsions—Dispersions

§ 414.71 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve discharges not exceeding the (mass) quantity determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

Effluent characteristics	BPT Effluent limitations [1]	
	Maximum for any one day	Maximum for monthly average
BOD5	92	34
TSS	159	49
pH	(2)	(2)

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.72 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

§ 414.73 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) The Agency has determined that for existing point sources whose total OCPSF production defined by § 414.11 is less than or equal to five (5) million pounds of OCPSF products per year, the BPT level of treatment is the best available technology economically achievable. Accordingly, the Agency is not promulgating more stringent BAT limitations for these point sources.

(b) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part.

(c) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that does not use end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.101 of this part.

§ 414.74 New source performance standards (NSPS).

(a) Any new source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part, and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) Any new source that does not use end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.101 of this part, and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

Effluent characteristics	NSPS [1] Maximum for any one day	NSPS [1] Maximum for monthly average
BOD5	92	34
TSS	159	49
pH	([2])	([2])

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.75 Pretreatment standards for existing sources (PSES).

(a)Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the following table for the metals pollutants times the flow from metal-bearing waste streams for metals and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent characteristics	Pretreatment standards [1]	
	Maximum for any one day	Maximum for monthly average
Acenaphthene	47	19

Benzene	134	57
Carbon Tetrachloride	380	142
Chlorobenzene	380	142
1,2,4-Trichlorobenzene	794	196
Hexachlorobenzene	794	196
1,2-Dichloroethane	574	180
1,1,1-Trichloroethane	59	22
Hexachloroethane	794	196
1,1-Dichloroethane	59	22
1,1,2-Trichloroethane	127	32
Chloroethane	295	110
Chloroform	325	111
1,2-Dichlorobenzene	794	196
1,3-Dichlorobenzene	380	142
1,4-Dichlorobenzene	380	142
1,1-Dichloroethylene	60	22
1,2-trans-Dichloroethylene	66	25
1,2-Dichloropropane	794	196
1,3-Dichloropropylene	794	196
2,4-Dimethylphenol	47	19
Ethylbenzene	380	142
Fluoranthene	54	22
Methylene Chloride	170	36
Methyl Chloride	295	110
Hexachlorobutadiene	380	142
Naphthalene	47	19
Nitrobenzene	6,402	2,237
2-Nitrophenol	231	65
4-Nitrophenol	576	162
4,6-Dinitro-o-cresol	277	78
Phenol	47	19
Bis(2-ethylhexyl)phthalate	258	95
Di-n-butyl phthalate	43	20
Diethyl phthalate	113	46
Dimethyl phthalate	47	19
Anthracene	47	19
Fluorene	47	19
Phenenthrene	47	19
Pyrene	48	20
Tetrachloroethylene	164	52

Toluene	74	28
Trichloroethylene	69	26
Vinyl Chloride	172	97
Total Cyanide	1,200	420
Total Lead	690	320
Total Zinc	2,610	1,050

[1] All units re milligrams per liter.

§ 414.76 Pretreatment standards for new sources (PSNS).

(a)Except as provided in 40 CFR 403.7 any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed above in § 414.75.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed above in § 414.75 for the metals pollutants times the flow from metal-bearing waste streams for metals and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Subpart H—Specialty Organic Chemicals

§ 414.80 Applicability; description of the specialty organic chemicals subcategory.

The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture of all SIC 2865 and 2869 organic chemical groups which are not defined as commodity or bulk organic chemicals in § 414.60 and § 414.70, respectively.

§ 414.81 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve discharges not exceeding the (mass) quantity determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

Effluent characteristics	BPT effluent limitations [1]	
	Maximum for any one day	Maximum for monthly average
BOD5	120	45
TSS	183	57
pH	(2)	(2)

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.82 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

§ 414.83 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) The Agency has determined that for existing point sources whose total OCPSF production defined by § 414.11 is less than or equal to five (5) million pounds of OCPSF products per year, the BPT level of treatment is the best available technology economically achievable. Accordingly, the Agency is not promulgating more stringent BAT limitations for these point sources.

(b) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.91 of this part.

(c) Except as provided in paragraph (a) of this section and in 40 CFR 125.30 through 125.32, any existing point source that does not use end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.101 of this part.

§ 414.84 New source performance standards (NSPS).

(a) Any new source that uses end-of-pipe biological treatment and is subject to this subpart must achieve discharges in accordance with § 414.9 of this part, and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) Any new source that does not use end-of-pipe biological treatment and is subject to this subpart must

achieve discharges in accordance with § 414.101 of this part, and also must not exceed the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

Effluent characteristics	NSPS [1] Maximum for any one day	NSPS [1] Maximum for monthly average
BOD5	120	45
TSS	183	57
pH	([2])	([2])

[1] All units except pH are milligrams per liter.
[2] Within the range of 6.0 to 9.0 at all times.

§ 414.85 Pretreatment standards for existing sources (PSES).

(a)Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the following table for the metals pollutants times the flow from metal-bearing waste streams for metals and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent characteristics	Pretreatment standards [1]	
	Maximum for any one day	Maximum for monthly average
Acenaphthene	47	19
Benzene	134	57
Carbon Tetrachloride	380	142
Chlorobenzene	380	142
1,2,4-Trichlorobenzene	794	196
Hexachlorobenzene	794	196
1,2-Dichloroethane	574	180
1,1,1-Trichloroethane	59	22
Hexachloroethane	794	196
1,1-Dichloroethane	59	22
1,1,2-Trichloroethane	127	32
Chloroethane	295	110
Chloroform	325	111
1,2-Dichlorobenzene	794	196
1,3-Dichlorobenzene	380	142
1,4-Dichlorobenzene	380	142
1,1-Dichloroethylene	60	22
1,2-trans-Dichloroethylene	66	25
1,2-Dichloropropane	794	196
1,3-Dichloropropylene	794	196
2,4-Dimethylphenol	47	19
Ethylbenzene	380	142
Fluoranthene	54	22
Methylene Chloride	170	36
Methyl Chloride	295	110

Hexachlorobutadiene	380	142
Naphthalene	47	19
Nitrobenzene	6,402	2,237
2-Nitrophenol	231	65
4-Nitrophenol	576	162
4,6-Dinitro-o-cresol	277	78
Phenol	47	19
Bis(2-ethylhexyl)phthalate	258	95
Di-n-butyl phthalate	43	20
Diethyl phthalate	113	46
Dimethyl phthalate	47	19
Anthracene	47	19
Fluorene	47	19
Phenenthrene	47	19
Pyrene	48	20
Tetrachloroethylene	164	52
Toluene	74	28
Trichloroethylene	69	26
Vinyl Chloride	172	97
Total Cyanide	1,200	420
Total Lead	690	320
Total Zinc	2,610	1,050

[1] All units are milligrams per liter.

§ 414.86 Pretreatment standards for new sources (PSNS).

(a) Except as provided in 40 CFR 403.7 any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed above in § 414.85.

(b) In the case of lead, zinc, and total cyanide the discharge quantity (mass) shall be determined by multiplying the concentrations listed above in § 414.35 for the metal pollutants times the flow from metal-bearing waste streams for metals and times the flow from the cyanide-bearing waste streams for total cyanide. The metal-bearing waste

streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the control authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Subpart I—Direct Discharge Point Sources That Use End-of-Pipe Biological Treatment

§ 414.90 Applicability; description of the subcategory of direct discharge point sources that use end-of-pipe biological treatment.

The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture of the OCPSF products and product groups defined by § 414.11 from any point source that uses end-of-pipe biological treatment or installs end-of-pipe biological treatment to comply with BPT effluent limitations.

§ 414.91 Toxic pollutant effluent limitations and standards for direct discharge point sources that use end-of-pipe biological treatment.

(a) Any point source subject to this subpart must achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) In the case of chromium, copper, lead, nickel, zinc, and total cyanide, the discharge quantity (mass) shall be

determined by multiplying the concentrations listed in the following table for these pollutants times the flow from metal-bearing waste streams for the metals and times the flow from cyanide-bearing waste streams for total cyanide. Metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the permitting authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent characteristics	Effluent limitations BAT and NSPS [1]	
	Maximum for any one day	Maximum for monthly average
Acenaphthene	59	22
Acrylonitrile	242	96
Benzene	136	37
Carbon Tetrachloride	38	18
Chlorobenzene	28	15
1,2,4-Trichlorobenzene	140	68
Hexachlorobenzene	28	15
1,2-Dichloroethane	211	68
1,1,1-Trichloroethane	54	21
Hexachloroethane	54	21
1,1-Dichloroethane	59	22
1,1,2-Trichloroethane	54	21
Chloroethane	268	104

Chloroform	46	21
2-Chlorophenol	98	31
1,2-Dichlorobenzene	163	77
1,3-Dichlorobenzene	44	31
1,4-Dichlorobenzene	28	15
1,1-Dichloroethylene	25	16
1,2-trans-Dichloroethylene	54	21
2,4-Dichlorophenol	112	39
1,2-Dichloropropane	230	153
1,3-Dichloropropylene	44	29
2,4-Dimethylphenol	36	18
2,4-Dinitrotoluene	285	113
2,6-Dinitrotoluene	641	255
Ethylbenzene	108	32
Fluoranthene	68	25
Methylene Chloride	89	40
Methyl Chloride	190	86
Hexachlorobutadiene	49	20
Naphthalene	59	22
Nitrobenzene	68	27
2-Nitrophenol	69	41
4-Nitrophenol	124	72
2,4-Dinitrophenol	123	71
4,6-Dinitro-o-cresol	277	78
Phenol	26	15
Bis(2-ethylhexyl)phthalate	279	103
Di-n-butyl phthalate	57	27
Diethyl phthalate	203	81
Dimethyl phthalate	47	19
Benzo(a)anthracene	59	22
Benzo(a)pyrene	61	23
3,4-Benzofluoranthene	61	23
Benzo(k)fluoranthene	59	22
Chrysene	59	22
Acenaphthylene	59	22
Anthracene	59	22
Fluorene	59	22
Phenenthrene	59	22
Pyrene	67	25
Tetrachloroethylene	56	22

Toluene	80	26
Trichloroethylene	54	21
Vinyl Chloride	268	104
Total Chromium	2,770	1,110
Total Copper	3,880	1,450
Total Cyanide	1,200	420
Total Lead	690	320
Total Nickel	3,980	1,690
Total Zinc [2]	2,610	1,050

[1] All units re milligrams per liter.

[2] Total Zinc for Rayon Fiber Manufacture that uses the viscose process and Acrylic Fibers Manufacture that uses the zinc chloride/solvent process is 6,796 *u*/l and 3,325 *u*/l for maximum for any one day and maximum for monthly average, respectively.

* * *

Subpart J—Direct Discharge Point Sources That Do Not Use End-of-Pipe Biological Treatment

§ 414.100 Applicability; description of the subcategory of direct discharge point sources that do not use end-of-pipe biological treatment.

The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture of the OCPSF products and product groups defined by § 414.11 from any point source that does not use end-of-pipe biological treatment and does not install end-of-pipe biological treatment to comply with BPT effluent limitations.

§ 414.101 Toxic pollutant effluent limitations and standards for direct discharge point sources that do not use end-of-pipe biological treatment.

(a) Any point source subject to this subpart must achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) In the case of chromium, copper, lead, nickel, zinc, and total cyanide, the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the following table for these pollutants times the flow from metal-bearing waste streams for the metals and times the cyanide-bearing waste streams for total cyanide. Metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the permitting authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and

(2) That the combination of such streams, prior to treatment, with the Appendix A waste streams would result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent characteristics	BAT effluent Limitations and NSPS [1]	
	Maximum for any one day	Maximum for monthly average
Acenaphthene	47	19
Acrylonitrile	232	94
Benzene	134	57
Carbon Tetrachloride	380	142
Chlorobenzene	380	142
1,2,4-Trichlorobenzene	794	196
Hexachlorobenzene	794	196
1,2-Dichloroethane	574	180
1,1,1-Trichloroethane	59	22
Hexachloroethane	794	196
1,1-Dichloroethane	59	22

1,1,2-Trichloroethane	127	32
Chloroethane	295	110
Chloroform	325	111
1,2-Dichlorobenzene	794	196
1,3-Dichlorobenzene	380	142
1,4-Dichlorobenzene	380	142
1,1-Dichloroethylene	60	22
1,2-trans-Dichloroethylene	66	25
1,2-Dichloropropane	794	196
1,3-Dichloropropylene	794	196
2,4-Dimethylphenol	47	19
Ethylbenzene	380	142
Fluoranthene	54	22
Methylene Chloride	170	36
Methyl Chloride	295	110
Hexachlorobutadiene	380	142
Naphthalene	47	19
Nitrobenzene	6,402	2,237
2-Nitrophenol	231	65
4-Nitrophenol	576	162
2,4-Dinitrophenol	4,291	1,207
4,6-Dinitro-o-cresol	277	78
Phenol	47	19
Bis(2-ethylhexyl)phthalate	258	95
Di-n-butyl phthalate	43	20
Diethyl phthalate	113	46
Dimethyl phthalate	47	19
Benzo(a)anthracene	47	19
Benzo(a)pyrene	48	20
3,4-Benzofluoranthene	48	20
Benzo(k)fluoranthene	47	19
Chrysene	47	19
Acenaphthylene	47	19
Anthracene	47	19
Fluorene	47	19
Phenanthrene	47	19
Pyrene	48	20
Tetrachloroethylene	164	52
Toluene	74	28
Trichloroethylene	69	26

Vinyl Chloride	172	97
Total Chromium	2,770	1,110
Total Copper	3,380	1,450
Total Cyanide	1,200	420
Total Lead	690	320
Total Nickel	3,980	1,690
Total Zinc [2]	2,610	1,050

[1] All units are micrograms per liter.

[2] Total Zinc for Rayon Fiber Manufacture that uses the viscose process and Acrylic Fibers Manufacture that uses the zinc chloride/solvent process is 6,796 *u*/l and 3,325 *u*/l for maximum for any one day and maximum for monthly average, respectively.

APPENDIX D

EPA'S RESPONSES TO COMMENTS

368. CG29 PC54 12/20/85 P. 19-21

COMMENT: EPA's proposed BAT rules suffer from the same defect noted by the commenter in regard to the BPT limits. EPA has failed to select the "best" technology as required by statute. In developing the BPT limits, EPA used editing criteria which resulted in 76 percent of all plants with biological treatment systems and reporting BOD data being categorized as "best performers." The commenter recommends that, similar to the case of BOD5 BPT limitations, EPA should recalculate BAT limits for all three options based on the the "best performer" using a data edit of 20 mg/l. EPA has violated the law by basing BAT on the average performance of a group of plants, which included some performing below the industry median, and by not selecting the best of available technologies. EPA failed to ascertain which plant(s) constitute the "best performer" as the statute requires. Further, because EPA lumped plants with biological treatment and in-plant controls together with plants with biological treatment and post-biological controls, BAT was not defined because the plants were not segregated based on their effectiveness at each of the three treatment stages; EPA did not define the improvement in effluent quality provided by exemplary pre- or post-biological treatment. EPA also violated the law by averaging variability factors.

RESPONSE: For a discussion of the Agency's rationale in establishing final BPT limitations, see the preamble. With regard to the Agency's methodology in establishing final BAT limitations for priority pollutants, EPA first identified technologies which were capable of achieving significant removals of these pollutants from wastewater. EPA then identified OCPSF plants where these technol-

ogies were in-place and were well-designed and well-operated. EPA obtained data from these facilities which were then edited to obtain only those data that are consistent with good or sound operation of the technologies involved. In the case of all pollutants, EPA has selected only a very small subset of the industry using the best available technology appropriately, and EPA has only used data that represented good performance. Variability factors derived for several plants (all of whom were best performers) were pooled so that a reasonable estimate could be made of the variability inherent even in the use of the best available technology. This has been EPA's approach in most BAT rulemakings. It ensures that the data from all of the best performers (who in any event were few in number) were considered in developing BAT limitations.

APPENDIX E

TRAINING MANUAL FOR NPDES PERMIT WRITERS

* * *

Statistical Considerations

Effluent limitations are probably the most important part of the permit. The effluent limitations are the primary mechanism for the control of discharges of pollutants. It is therefore important that the permit writer have a basic understanding of the principles of effluent variability and permit limit derivation.

The quality of the effluent from a treatment facility will normally vary over time. If BOD data for a typical treatment plant are plotted against time, the day-to-day concentrations variations can be seen (See Figure 3-1). Some of this behavior can be described by constructing a frequency-concentration plot. From this plot, one can see that for most of the time, system can be described using the mean concentration of the parameter of interest (i.e., the long term average) and the variance (or coefficient of variation) and by assuming a particular statistical distribution (usually lognormal).

Permit limits are generally set at the upper bounds of acceptable performance. Requirements are usually expressed using two types of permit limits. The *daily maximum* permit limit is the maximum allowable value for any single observation. The *average daily* or "*monthly*" permit limit is the maximum allowable value for the average of all observations obtained during one month. (Average daily limits for weekly periods are also used for POTW's.) If permit limits are set too high relative to the long term average, a discharger *not* complying with expected performance will not exceed the limits. If permit limits are set too low, a discharger that is complying with expected performance may frequently exceed the limits.

It is important to note that statistical variability is already "built in" with respect to the effluent limitation guidelines, and the permit writer need not perform a separate evaluation in those cases where a permit limitation is derived from a guideline. Regulatory agencies have settled on a statistical confidence rate of 1% to 5% (typically, 1% rates for the daily maximum, 5% rate for the monthly average). These confidence rates correspond to the 99th to 95th percentiles of a cummulative probability distribution. The 99th percentile limit is less stringent than the 95th percentile limit. Thus, a discharger running a properly operated and maintained treatment facility has a 95-99% chance of complying with its permit limits in any single monitoring observation. Of course, if the facility is poorly operated or maintained, or plant production increases, variability, and likewise permit violations, are likely to occur more frequently.

TABLE VII-60.
EXPLANATION OF BAT TOXIC POLLUTANT DATA
BASE PERFORMANCE EDITS

Plant ID	Pollutant Name	Explanation
2313T	Benzene, Chorobenzene, 1,2-Dichloroethane, 2,4,6-Trichlorophenol, Chloroform, 3,3'-Dichlorobenzidine, Toluene	This plant experienced a malfunction of its in-plant chemical oxidation unit during the sampling period which caused high concentrations of 3,3'-dichlorobenzidine to be discharged to the end-of-pipe biological system; this may have caused an upset of biological activity which was evidenced by the low removals of the listed pollutants through biological treatment, or compared to other biological treatment systems treating similar raw waste concentrations. Also, certain pollutants (2,4,6-trichlorophenol, 3,3'-dichlorobenzidine) must be treated in-plant prior to discharge to an end-of-pipe biological system to obtain adequate treatment. Therefore, the Agency considers this plant's treatment system performance for the listed pollutants to be inadequate.

725T	Methylene Chloride, Methyl Chloride and Vinyl Chloride (Subcategory Two Steam Stripper data for 5/29/83, 6/02/83)	Data for these pollutants from this plant were deleted because steam stripper performance for these 2 days was considered inadequate; the maximum design effluent concentration for this steam stripper should be 10 mg/1 for vinyl chloride which is based on a NIOSH air regulation. This maximum was exceeded on both these days; therefore, the Agency considers this plant's steam stripper performance for the listed pollutants to be inadequate for these 2 days.

Note: Plants with V-suffix are verification study plants, plants with F-suffix are EPA/CMA 5-Plant Study plants, and plants with T-suffix are EPA 12-Plant Study plants.